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The findings from a mail survey of State and Territorial non-hazardous waste regulatory programs are given. The survey determined: State organization and resources; number and characteristics of landfills, land application units, and surface impoundments; and characteristics of the regulatory program. The study methodology and a description of the statistical reliability of the data are presented. Basic information on the total number and characteristics of disposal facilities, including ownership, acreage, amount of waste received, monitoring systems, design elements, and operational controls is given. Data on State regulations and enforcement patterns are included. Also given are estimates of the number of facilities that receive exempted amounts of small quantity generator hazardous waste.

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PART I

INTRODUCTION

Section 1. Introduction
Section 2. Study Methodology
Section 3. Statistical Reliability

PART I
INTRODUCTION

This report summarizes the findings of a census of State and Territorial Subtitle D non-hazardous waste programs. The census was conducted by mail, with extensive telephone followup, during the fall and winter of 1985-86. The census was sponsored by the United States Environmental Protection Agency's Office of Solid Waste, in cooperation with the Association of State and Territorial Solid Waste Management Officials (ASTSWMO), and was administered by Westat, Inc., a national survey firm based in Rockville, Maryland. Westat provided technical assistance in designing the census, implementing it, and analyzing its results.

The census of Subtitle D non-hazardous waste programs included all 50 States, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Marianas. The District of Columbia is not included in the results of the study because it reported no Subtitle D facilities and no Subtitle D program.

This report, developed by Westat for the Office of Solid Waste, describes the background, objectives, methods, results, and conclusions of the census of State and Territorial Subtitle D non-hazardous waste programs.

The body of the report is organized in six major parts composed of twelve sections in all. Part I (Sections 1-3) contains the introduction to the report, the study methodology, and a description of the statistical reliability of the data. Part II (Section 4) describes State organizational structures and resources for Subtitle D programs. Part III (Sections 5-7) provides information on the total number and basic characteristics (ownership, acreage, amount of waste received, monitoring systems,design and operational controls) of Subtitle D waste facilities. Part IV (Sections 8-10) provides data on Subtitle D regulatory programs, including information on regulations and enforcement patterns. Part V (Section 11) contains information with respect to the number and quantity of Subtitle D facilities that receive exempted non-household hazardous waste. Part VI (Sections 12 and 13) provides a summary and conclusions of the report.

There are four appendices to this report. Appendix A provides the responses to a question on the survey concerning landfill capacity problems. Appendix B contains data tables with estimates of landfill tipping fees. The cover letters that accompanied the questionnaire are in Appendix C. Appendix D is a copy of the State Subtitle D Program Questionnaire.

provides information on the total number and basic characteristics (ownership, acreage, amount of waste received, monitoring systems,design and operational controls) of Subtitle D waste facilities. Part IV (Sections 8-10) provides data on Subtitle D regulatory programs, including information on regulations and enforcement patterns. Part V (Section 11) contains information with respect to the number and quantity of Subtitle D facilities that receive exempted non-household hazardous waste. Part VI (Sections 12 and 13) provides a summary and conclusions of the report.

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1. BACKGROUND

The background of this study, including a summary of pertinent Subtitle D legislation, a description of the need for the study, and a review of the scope and focus of the study are presented in this section.

1.1 RCRA Subtitle D Non-Hazardous Waste Program

Congress enacted the Resource Conservation and Recovery Act (RCRA) in 1976 to protect human health and the environment from improper waste management practices. In 1979, under authority of Sections 1008(a) and 4004(a) of Subtitle D of RCRA, EPA promulgated "Criteria for Classification of Solid Waste Disposal Facilities and Practices" for determining what solid waste disposal practices pose a reasonable probability of adverse effects on health and the environment (40 CFR Part 257). States were encouraged to use the "Criteria" to classify facilities as either open dumps or sanitary landfills. Those facilities that violated the "Criteria" were to be classified as open dumps.

In 1979, EPA also promulgated guidelines for the development of State Solid Waste Management Plans (40 CFR Part 256). These guidelines required that States seeking EPA Subtitle D grant funds have the authority to prohibit, close, and upgrade open dumps. Grant funds were available from 1977 to 1981. Outside of approval of State plans and the disbursement of grant funds, EPA had no direct implementation authority. State participation in this program was voluntary.

EPA's funding of State Subtitle D activities was terminated after 1981. Since then the focus of EPA's efforts has been on the Subtitle C (hazardous waste) program. As a result of terminating Subtitle D activities in 1981, little information was available to EPA on the status of State non-hazardous waste programs and on the facilities themselves.

The RCRA Amendments (signed into law on November 8, 1984) require EPA, by November 8, 1987, to submit a report to Congress addressing:

- whether the RCRA 1008(a) and 4004 criteria (40 CFR 257) are adequate to protect human health and the environment from ground-water contamination, and
- whether additional authorities are needed to enforce the "Criteria".

Further, EPA must revise the "Criteria" by March 31, 1988, for facilities that may receive hazardous waste or small quantity generator waste. These revisions are to include ground-water monitoring, location restrictions, and corrective action, as appropriate.

Within 18 months of the promulgation of the revised "Criteria", each State must develop a permit program or other system of prior approval and conditions to ensure that each facility that may receive hazardous household waste or small quantity generator waste is in compliance with the "Criteria". The 1984 Amendments envision Subtitle D to continue to be a State-implemented program. If States fail to enforce the "Criteria", however, EPA may do so.

1.2 Need for the Survey of States and Territories

In order to determine whether the present Subtitle D Criteria are adequate and to assess whether additional authorities are needed to enforce the criteria, EPA developed a plan for the completion of a major Subtitle D study. The census of State and Territorial Subtitle D non-hazardous waste programs described in this report is a major component of the overall EPA Subtitle D study plan. The primary objectives of the overall EPA Subtitle D study are to:

1. Evaluate the extent and causes of human health and environmental impacts at Subtitle D facilities;
2. Evaluate management practices and control technologies, including siting, liners, monitoring, and corrective action;
3. Evaluate State programs (status, effectiveness, needs); and
4. Determine whether the RCRA 1008(a) and 4004 criteria are adequate to protect human health and the environment.

Data from the State/Territorial census were required to determine the effectiveness of current Subtitle D guidelines and regulations, to examine the extent of any program deficiencies, and to recommend measures to Congress that would improve the effectiveness of the Subtitle D program. These data were also to be used in EPA's regulatory analyses and decision making processes. More specific information regarding the objectives of the census of State and Territorial non-hazardous waste programs is provided in the next section.

1.3 Scope and Focus of the Subtitle D Census

The mail questionnaire Subtitle D census included all 50 States, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Marianas. The District of Columbia was included in the mailing, but no results are given in this study because it reported no Subtitle D facilities and no Subtitle D program.

The mail questionnaire used in the Subtitle D census was designed to collect data in the following areas: (1) State organization and resources; (2) State regulations and enforcement; (3) numbers of Subtitle D facilities and establishments; (4) unit design and operating characteristics; (5) data availability; and (6) contact persons for Subtitle D programs.

The survey questionnaire included the following sections: General Instructions, State Organization and Resources, Landfills, Land Application Units, and Surface Impoundments. The sections for the latter three categories (facility types) were each further broken down into the following subsections:

- Regulations;
- Enforcement;
- Numbers of units and establishments;
- Design and operating characteristics;
- Availability of additional data; and
- Contact persons.

Data on regulations were sought to help evaluate the status of each State's Subtitle D program. Enforcement data were requested to help determine the level of implementation of the regulations.

Data on the numbers of facilities and establishments were sought to define the potential universe of affected Subtitle D units for use in the analyses of regulatory and nonregulatory options and the revision of the "Criteria."

Design and operating characteristics were requested to determine how frequently various Subtitle D facility designs and operating methods are used. These data were necessary for the completion of a regulatory impact analysis.

Questions on the availability of data were designed to identify States and Territories with monitoring data and case study data that could be used for detailed evaluations of specific technologies.

The information on State contact persons was requested to allow EPA to clarify responses in the study.

The questionnaire included responses concerning municipal wastewater surface impoundments. Information on these facilities was collected to be used by EPA's Office of Water Programs in a separate regulatory effort. These facilities are specifically exempted from Subtitle D regulations but are regulated under the Clean Water Act. Municipal wastewater surface impoundments are not included in the data reported here, with the exception that the total number of such facilities is reported in Section 7.2. Also, waste piles, while regulated under Subtitle D, were not included in this survey because of the difficulty in defining waste piles across States. Data concerning these Subtitle D facilities will be collected in the future using a different methodology.

2. STUDY METHODOLOGY

In this section the study methodology is described, including the basic data collection technique, data collection instrument, and the many varied quality control procedures that were used in the study.

2.1 Data Collection Technique

A census of all States and Territories was selected as the basic study methodology rather than a sampling of States and Territories because of the small number of total units in the population and their great variability with respect to the study estimates.

A mail questionnaire data collection approach was selected rather than in-person interviews or telephone interviews as the primary data collection approach. In-person reviews of State and Territorial records would have been desirable, but the large amount of information desired and the fact that in many cases this information was not easily accessible would have resulted in far too great a financial cost to perform the study using in-person visits. Telephone interviews were not suitable as the primary data collection approach because they would not allow time for the respondents to consult records, files, and other individuals when answering the questions.

The basic mail packet sent out to each State and Territory included the following:

1. A cover letter from EPA (shown in Exhibit C.1, Appendix C);

2. A cover letter from the Association of State and Territorial Solid Waste Management Officials (ASTSWMO) (shown in Exhibit C.2, Appendix C);

3. Multiple copies of the study questionnaire (shown in Appendix D); and

4. Self-Addressed, postage-paid return envelopes.

2.2 Data Collection Instrument

The questionnaire used in the Census of State and Territorial Subtitle D Programs was developed in successive stages, incorporating inputs from EPA personnel, contractor personnel, and representatives from ASTSWMO. An initial list of information requirements based upon an assessment of data needs was developed by EPA and circulated to a number of EPA offices for comment. Contractor personnel then translated this list of information needs into specific questions for the study. The initial draft of questions was then circulated once again within EPA for additional comment. Revisions were then made to the questionnaire and a series of discussions between EPA, contractor personnel, and representatives from ASTSWMO were then held to revise and finalize the questionnaire.

The major conclusions of these discussions were that:

1. Subtitle D programs and definitions of basic terms vary widely from State to State;

2. Previous data collection efforts suffered from the fact that they were incomplete;

3. Detailed information, in certain instances, would be easier for respondents to provide than aggregated information; and

4. Structuring the questionnaire into four major section would allow more than one individual to complete the questionnaire, enabling specialists to work together on questionnaire completion, while reducing overall respondent burden.

Based upon the above conclusions a number of questionnaire changes relating to quality control were incorporated into the data collection instrument. These changes are described in Section 2.4, Quality Control Procedures.

2.3 Pretest of Instruments and Procedures

A pretest of the data collection instrument was conducted in nine States. The conditions of the pretest simulated the full survey, except that:

- respondents were asked to complete the data collection form in less time than was to be allotted in the study;
- respondents were precontacted and urged to supply a swift response for pretesting purposes; and
- contractors actively solicited comments by telephone on respondent suggestions for improving the questionnaire.

The results of the pretest indicated that the definitions, instructions, sample questions, and diagrams were understood by the respondents, but that significant amounts of time would be required for completion of the questionnaires.

2.4 Quality Control

Numerous quality control (QC) techniques were used in the Census of State and Territorial Subtitle D Programs. These techniques were applied in the design of the data collection instrument, in the visual editing of all mail returns, in the telephone followups conducted to resolve inconsistencies in responses, and in the computer editing of all data. In addition, the "Subtitle D Specialist" was available through a toll-free telephone number if respondents needed clarification of any items on the questionnaire.

2.4.1 Questionnaire Design QC Techniques

To help ensure that respondents understood the questions and were responding to the same question in a consistent fashion, the questionnaire was designed to include the following:

- Definitions of all facility types included in the study;
- Diagrams of each facility type indicating the specific facility types that would and would not be included in the responses;
- Instructions built into the questionnaire to standardize the dimensions on which responses were being made (e.g., calendar year 1984, Fiscal Year ending in 1984); and
- Sample questions indicating how responses were to be recorded for each major question/response format used in the questionnaire.

Whenever possible, the questionnaire was also designed to indicate cases in which responses to one question were to match responses to another question. These served as cross-checks for the respondents while they were completing the questionnaire.

As a further quality control technique the questionnaire included a respondent rating system. This rating system allowed respondents the opportunity to indicate that they believed the quality of one of their responses was good, fair, poor, or very poor. The rating system thus allowed for the determination of data quality as a whole in the analysis of the study data. The instructions provided in the questionnaire for the data quality rating system are provided in Appendix D, on page 7 of the questionnaire.

2.4.2 Visual Editing QC Techniques

Each returned questionnaire was immediately logged in and reviewed as another quality control technique. These visual edits included, for the most part, the same basic checks the computer data editing programs were set up to accomplish. The following is a partial list of the types of visual edits made:

- checks on the completeness of the data, (identification of specific questionnaire items with missing responses);

  checks on the consistency of the data (review of responses from one question to another to determine if answers were consistent); and

- checks on the accuracy of the data (determination as to whether or not a particular response was accurate based on comparisons with other data, including reviews of secondary data, lists supplied by the States, results of other research studies conducted in the past, etc.);

2.4.3 Telephone Followup QC Techniques

Telephone callbacks to the key contact persons listed for each major section of the questionnaire represented a major quality control technique in the Subtitle D census. Telephone callbacks were made to resolve each item identified in the visual edit as requiring explanation. Approximately 50 of the 55 States and Territories were recontacted by telephone. On the average it was necessary to contact four people in each State/Territory during the telephone followup QC attempts. In one State, however, it was necessary to speak with 11 individuals regarding various responses in the questionnaire. Numerous recontacts were often required as records, files, and other individuals within the State were often consulted by the State and Territorial contacts in the process of resolving the questionnaire responses. In all, data quality callbacks were made over a three and one-half month period. On the average, over two and one-half hours of actual telephone connect time was required to resolve questionnaire data issues in each of the 50 States and Territories which were recontacted by phone.

2.4.4 Computer Editing QC Techniques

A very large number of computer editing checks, corresponding to all of the visual edit checks, plus additional checks which were more difficult to observe, were conducted in the Subtitle D Census. Computer range checks, error checks, logic checks, and other editing procedures were applied after the visual editing and primary round of telephone followups were completed. Each inconsistency in questionnaire data was then flagged and a second round of recontacts with State/Territorial personnel were accomplished in an attempt to resolve all possible errors, omissions, and inconsistencies in the questionnaire data set before analyzing the data.

2.4.5 Data Entry QC Techniques

All data entered on the Subtitle D census data tape were 100 percent key verified. In addition, a number of key questionnaire items were analyzed separately and compared with the data on the data tape to ensure the accuracy of data entry.

2.4.6 Toll-Free Telephone Number

The toll-free number to reach the Subtitle D Specialist was used quite frequently. The respondents usually wanted clarification of the definitions of various types of facilities. Several calls concerned the fact that the questionnaire had not reached the appropriate office or agency and the person receiving the questionnaire was unsure where to send it.

3. STATISTICAL RELIABILITY

In this section the quality of the data obtained in the Census of State and Territorial Subtitle D Non-Hazardous Waste Programs is addressed. This section has been prepared to help the reader answer the following types of questions:

- How much confidence can one place in the estimates presented in this report;
- What are the limitations of the study data;
- Are some estimates inaccurate; and
- Which estimates appear to be the most (and least) reliable?

3.1 Overview of Statistical Reliability

Statistical reliability is a function of the objectives of the study, the particular research techniques one elects to apply in the study, and the many varied methods and procedures used to carry out the study.

A principal objective of the study described here was to estimate the total number of elements in a predefined population. Estimates of the total number of dollars and hours expended on Subtitle D activities, the total number of permitted and unpermitted Subtitle D facilities, and the total number of facilities by type (e.g., municipal landfills, oil or gas waste surface impoundments) were required.

The primary research approach for the estimation of total numbers in this study was a mail questionnaire census of all State and Territorial Subtitle D programs. A census was selected as the research methodology, rather than a sample of States and Territories, due to the small number of total elements in the predefined population (50 States and five Territories) and due to the great variability expected within States and Territories with respect to the estimates to be generated. Also, a census would provide one additional advantage over a sample survey---no sampling error would be associated with the study estimates. That is, no inherent error would be encountered due to the fact that a sample was taken rather than a complete census of the population. Any errors that would be associated with the study would thus fall under the general category of non-sampling errors. Non-sampling errors are discussed below.

3.2 Types of Non-Sampling Errors

Non-sampling errors refer to all of those errors in a study that are not attributable to sampling. Although such potential errors are generally difficult to quantify, it is important to acknowledge these sources so that users of study data may be aware of their possible effects.

Potential sources of non-sampling errors include:

- difficulty in locating information;
- misinterpretation of questions;
- inadequate definitions of terms;
- inappropriate assumptions in the questions;
- rounding errors;
- conversion errors (e.g., gallons to tons);
- biased or ambiguous questions;
- transcription errors;

- undetected data entry errors;
- nonresponse errors; and
- estimation errors.

These and other sources of errors produce an overall non-sampling error in a study. While, in general, the overall non-sampling error cannot be measured precisely from the data collected in a study, it is nonetheless possible to assess the likely overall impact of such errors on various survey estimates. Indicators of non-sampling error in this study are presented below.

3.3 Indicators of Non-Sampling Errors

There were three primary indicators of the existence of non-sampling errors in the Census of State and Territorial Subtitle D Non-Hazardous Waste Programs. First, was the response rate to the study as a whole and to each of the individual questions asked in the study. Second, were reports of the quality of data from the respondents themselves. Third, were the visual and computer edit checks made on the completed questionnaires. Each of these is treated individually below.

3.3.1 Nonresponse

Ideally, one would obtain estimates from each population element for each estimate to be produced in a study. Seldom, however, is such an ideal situation actually encountered. Some amount of nonresponse is almost always encountered. Generally, adjustments to study data are required to account for this nonresponse and to reduce its potential impact.

There are a wide variety of techniques available for making adjustments due to nonresponse. None of these techniques were applied in the present study, however, for the following reasons.

1. First, great variability was observed from one State and Territory to another with respect to the actual values of the estimates. A very small number of States and Territories often accounted for a very large portion of the total for many variables being studied. The very small number of total elements in the population, their great variability and the importance of a very small number of States and Territories all combined to make indirect estimations or extrapolations for the nonrespondents potentially subject to an unknown amount of error.

2. Second, it was determined that a large percentage of the nonresponse in this study was directly attributable to the inability of States and Territories to compile existing information. Thus, it would be possible through further data collection efforts, if necessary, to fill in many of the gaps in the data by additional research efforts.

3. Third, a very important underlying objective of this study was to identify where gaps exist in the data. For example, extensive regulations covering particular types of Subtitle D facilities might be one indicator of the potential effectiveness of Subtitle D programs. If the number of Subtitle D facilities to which these regulations were to be applied were unknown, however, a somewhat different conclusion regarding Subtitle D program effectiveness might be reached. Nonresponse due to the inability of States and Territories to provide information was thus a type of conclusion in and of itself.

4. Fourth, and most importantly, it was decided that the most accurate projections of estimates for nonresponse would involve additional data collection efforts that would not be within the scope of this study.

Obviously, if one wishes to estimate totals for a population as a whole, and gaps due to nonresponse are present for some of the units in the population, an underestimate is encountered. This is the case with many of the estimates presented in this report. Because this is so, the reader is advised to review the information on response rates presented with each study estimate.

In general, nonresponse is an important factor to be considered with respect to most estimates presented in this report. Nonresponse is especially important, however, with respect to the following:

- estimates of the total number of dollars and hours spent on Subtitle D activities;
- estimates of the total number of surface impoundments; and
- estimates of the total number of industrial Subtitle D facilities.

Once again, however, the reader is advised to take the potential effects of nonresponse into consideration when reviewing each estimate in this report. To aid in this assessment, there are entries labelled "Response rate" on most of the tables in this report. Response rate is calculated as the number of facilities for which responses were obtained divided by the total number of facilities reported of a given type. Thus, the higher the response rate, the more reliable are the estimates to which the response rate applies.

3.3.2 Respondent Data Quality Ratings

Respondent ratings of the quality of the data they reported in this study were obtained in two ways. First, as described in Section 2.4.1, a respondent data quality rating system was built into the questionnaire. Second, perceptions of the quality of the study data were requested of respondents in followup telephone conversations.

In general, with respect to the total number and types of Subtitle D facilities, the quality of the data regarding municipal waste landfills is the highest. Most States and Territories have comparatively up to date record-keeping systems with regard to municipal waste landfills and most estimates provided in the study appear to be rather reliable for these types of Subtitle D facilities.

In general, with respect to the total number and types of Subtitle D facilities, the quality of the data regarding surface impoundments is the lowest. Only a very small number of States appear to have up-to-date information with respect to the number and types of surface impoundments within their jurisdictions. Respondent data quality ratings for estimates on surface impoundments were frequently in the poor to very poor range. Telephone conversations with the respondents indicated further that little information regarding surface impoundments is readily available. In some cases information exists in State files regarding surface impoundments, but this information has never been compiled and is not in a format that is usable for management purposes. In many other cases, the most recent information available to States on the total number of surface impoundments was obtained as part of an EPA-sponsored study that was conducted during the 1979-1980 time period.

In general, the quality of the data regarding the number and types of land application units and the number and types of industrial waste Subtitle D facilities is somewhere between the high quality of the municipal waste landfills and the low quality of the surface impoundments. Ratings for land application units and industrial facilities types were frequently in the fair, poor, or very poor range.

In general, data with respect to the number of permitted and licensed facilities, the number of inspections, and the number of violations were estimated using available State and Territorial records and thus these data may be somewhat more reliable than other estimates for which no records were available. While some States and Territories may not have been able to consult their records to the extent they wished when answering these questions, most respondents reported that attempts were made to consult existing information with respect to permitted facilities, inspections, and violations.

In general, information with respect to the number of Subtitle D facilities having monitoring systems and release prevention/management methods was estimated without the benefit of existing records. The quality of these estimates is likely to parallel somewhat the quality of the estimates of the specific facility types mentioned earlier (e.g., highest for municipal waste landfills, lowest for surface impoundments, etc.).

3.3.3 Visual and Computer Editing

A third and final indication of the statistical reliability of the data and the extent of non-sampling errors encountered in the study was obtained as a result of the visual and computer editing of the questionnaire data. Visual and computer editing approaches are described in Section 2.4, Quality Control.

A very large number of errors, inconsistencies, and omissions were observed when initial visual edits were made of the returned questionnaire data. Cross-checks built into the questionnaire for quality control purposes were first used to identify respondent errors and inconsistencies. All missing data elements were then listed. Telephone followup calls were then made in an attempt to resolve all issues.

The vast majority of the errors, inconsistencies, and omissions found in the original questionnaire data were resolved through these extensive telephone followups. Whenever it was impossible to resolve an error, inconsistency, or omission in the questionnaire data, the standard practice was to treat the information as missing for purposes of final study estimates.

Computer edit checks were then made to identify any issues overlooked during the visual editing checks. Additional telephone followups were then conducted until all non-sampling errors due to misinterpretation of questions, inappropriate assumptions, transcription errors, etc., that could be identified were resolved.

In general, while there were many non-sampling errors encountered in the visual and computer editing stages of the project, the vast majority of these were resolved through telephone followup contacts. Those which could not be resolved were treated as missing data for purposes of this report.

PART II

STATE ORGANIZATION AND RESOURCES

Section 4. State Organization and Resources

PART II

STATE ORGANIZATION AND RESOURCES

Part II provides information with respect to State organizational structures and financial resources for Subtitle D activities. The following study findings are presented in Part II:

- types of State agencies involved in developing, regulating, enforcing, overseeing, and otherwise administering any part of the Subtitle D program;
- total dollar amount budgeted and/or spent by State agencies for Subtitle D related work for the fiscal year ending in 1984;
- sources of Subtitle D related funding in fiscal years ending in 1984 and 1985;
- total number of person hours expended by State agencies on work directly related to Subtitle D establishments, issues, and activities during the fiscal year ending in 1984;
- types of Subtitle D activities engaged in by State agencies; and
- rankings with respect to the overall improvement expected in a variety of activities assuming additional resources were available for Subtitle D programs.

To properly interpret the findings provided in this part of the report, the reader is advised to review Part I, Section 3, "Statistical Reliability" and the complete discussion within each section below.

4. STATE ORGANIZATION AND RESOURCES

4.1 Agencies Involved in Subtitle D Activities

As part of this study, each State and Territory was asked to list all agencies having separate budgets that were responsible for developing, regulating, enforcing, overseeing, and otherwise administering any part of the Subtitle D program. A total of 141 agencies (an average of 2.6 agencies per State/ Territory) were listed. Responses were obtained in all cases with the exception of one U.S. Territory.

A wide variety of agency types are reported to become involved in Subtitle D activities. Solid waste and water related agencies were listed most frequently. In many cases, departments of environmental protection, natural resources, public works, and health were listed as overseeing agencies. Numerous other agencies were reported as well to be involved in administering programs for specific Subtitle D facility types. Such agencies included oil and gas commissions, mining and reclamation bureaus, soil conservation commissions, bureaus of energy or geology, and air compliance, agriculture, livestock, and other offices.

Subtitle D programs for landfills were most frequently reported to be administered by solid waste agencies. Subtitle D programs for surface impoundments were most frequently reported to be administered by water agencies. Subtitle D land application programs were generally administered, depending upon the State involved, by either a solid waste agency or a water agency.

In general, the organization of Subtitle D activities varied greatly from one State or Territory to the next.

It is likely that not all agencies involved in Subtitle D related activities were listed by States and Territories. With the possible exception of most Solid Waste Agencies, the activities of other State agencies are not generally perceived to be related to Subtitle D programs. This is true even though agency activities may involve direct enforcement efforts for particular types of Subtitle D facilities. Many water agencies, for example, do not view their own activities as involving Subtitle D legislation, nor do others view them as such. This finding was repeated time and again in the telephone followups to the mail questionnaire data. In one State, the key contact person for two sections of the questionnaire (Part III. Land Application Units and Part IV. Surface Impoundments) was the director of that State's water group, and yet the water group was not listed as an agency involved in Subtitle D activities. Subsequent telephone calls indicated that the State water agency was inadvertently omitted from the original mail questionnaire list and that the water agency, in fact, spent considerably more money on Subtitle D facilities than did all other agencies in that State, combined. It is possible that other water agencies were unintentionally omitted from the list as well because water agencies are not generally perceived to have activities related to Subtitle D programs.

Other agencies that are responsible for only one particular type of Subtitle D facility may also have been omitted from the lists. Oil and gas commissions, mining offices and other offices that are responsible for oil or gas waste or mining waste surface impoundments only may also have been omitted. Based on mail questionnaire returns it was often necessary to recontact some States and Territories by telephone to obtain further information regarding a survey response. In numerous cases, telephone followup personnel were directed to agencies, such as oil or gas commissions for further information on numbers of inspections conducted, violations reported, etc., even though these agencies were not reported on the list of agencies involved in Subtitle D activities.

Another important point is that few agencies are perceived to have a specific budget for Subtitle D activities. In numerous cases State agencies were not initially listed in the questionnaires because they were not perceived to have Subtitle D budget monies. This was the case even though these agencies may have spent considerable sums in inspecting Subtitle D facilities. In some cases it appears that money is redirected from other agency programs to help offset the lack of money for Subtitle D programs. In these and other cases respondents were reluctant to list an agency "with a separate budget that is responsible for developing, regulating...any part of the Subtitle D program," as the question was Stated in the mail survey. Telephone followup contacts were attempted with each State and Territory to encourage respondents to list State agencies involved in Subtitle D programs, even though they may not have had a predetermined budget specifically for Subtitle D programs.

As a result of all telephone followup contacts a total of 25 State agencies involved in Subtitle D activities were added to the original mail questionnaire returns. It is likely that a number of additional agencies were not discovered by telephone.

In addition to the above factors, the list of State agencies may also be incomplete with respect to the inclusion of regional or district offices of major State agencies responsible for Subtitle D activities. Only a small number of States elected to include regional or district offices on their lists, even though State organizational structures are such that these offices may be heavily involved in Subtitle D inspection/ enforcement programs.

4.2 Total Dollars Spent on Subtitle D Activities

Respondents were asked to provide budget information for each agency identified as being involved in developing, regulating, enforcing, overseeing, and otherwise administering any part of the Subtitle D program. Dollars spent on Subtitle D related activities were reported for 104 out of 141 agencies listed. The total dollar amount reported for these agencies was $39,282,445. California reported spending the most on Subtitle D related activities ($9,476,255). The average number of dollars reported per State/Territory was $785,649.

The total dollar amount reported above is likely to be a large underestimate of the total dollars spent in FY 1984 on Subtitle D related activities. No estimates of dollars spent were provided for 39 of 141 agencies listed. Water agencies accounted for one-third of these cases (13) with missing dollar information. As Stated in Section 4.1, many water agencies do not perceive their activities to be Subtitle D related and many do not consider themselves to have a Subtitle D budget. In telephone followup requests to obtain even very rough estimates of the amount of money spent on Subtitle D activities by these agencies, no information could be provided. This was often because the agencies were not certain as to what would be a Subtitle D related activity or how they would attempt to separate out such activities in their overall budget. It should also be noted that dollars directed towards municipal wastewater surface impoundments are not technically Subtitle D funds but may have been included in the amounts reported by the States. Those facilities were included in the survey, but are not included in this report.

In general, water agency expenditures were somewhat larger on the average ($631,389 per State/Territory), than were solid waste agency expenditures ($427,184 per State/Territory). This indicates further that the above estimate is indeed an underestimate as no budget information was provided for 13 water agencies.

In addition to the 39 agencies having unknown budgets, an underestimate was also likely to result because not all agencies were likely to have been listed in the first place as described in Section 4.1. One State noted that budget did not include county expenditures, although the counties in that State may have spent more on Subtitle D than did the State.

4.3 Sources of Funding for Subtitle D Activities

Each State was asked to provide the percentage of its total Subtitle D budget for fiscal years 1984 and 1985 that came from State, federal, license or user fees, and other funding sources. Study estimates on sources of Subtitle D funding are presented in Table 4.1.

State funding sources were said to account for 84.6 percent of all Subtitle D funding in fiscal year 1984 and 85.1 percent in fiscal year 1985. Federal funding sources were said to account for only 7.5 percent of all Subtitle D funding in FY 1984 and only 7.1 percent in FY 1985; federal funding sources were almost exclusively for the funding of water programs. License or user fees programs were reported in nine States during

Table 4.1. Sources of Subtitle D funding

Funding Source	Fiscal year ending in 1984	Fiscal year ending in 1985
State sources	84.6%	85.1%
Federal sources	7.5%	7.1%
License or user fees	3.5%	6.0%
Other	4.4%	1.9%
TOTAL	100%	100%

FY 1984 (3.5% of funding) and ten States during FY 1985 (6.0% of funding).

Nebraska indicated that 42 percent of its Subtitle D funds came from a license or user fees program both in FY 1984 and FY 1985. Other States reporting funding from licenses or user fees in FY 1984 were New Jersey (20%), Arkansas (16%), Wisconsin (15%), Minnesota (5%), Alabama (5%), Oregon (3%), Colorado (3%), and New Hampshire (1%). Significant increases in the percentage of Subtitle D funding from license or user fees were reported from FY 1984 to FY 1985 in New Jersey (FY84 - 20%; FY 85 - 33%), Oregon (FY84 - 3%; FY85 - 21%), and Wisconsin (FY84 - 15%; FY85 - 22%). The State of Louisiana reported that a license or user fee program would be initiated in FY 1985 that would account for approximately 18 percent of its total funding for Subtitle D activities.

District funding sources in Idaho and an Environmental License Plate Fund in California were reported as "other" sources of funding, accounting for 4.4 percent of all Subtitle D funding in the U.S. in FY 1984 and 1.9 percent in FY 1985. A significant decrease in the percentage of Subtitle D funding was anticipated in the State of California from FY 1984 to FY 1985 from the Environmental License Plate Fund (from 17% in FY 1984 to only 7% in FY 1985).

4.4 Total Hours Expended on Subtitle D Activities

Each State and Territory was asked to estimate the total number of person hours each agency expended on work directly related to Subtitle D establishments, issues, and activities during the fiscal year ending in 1984. Estimates of hours expended were reported for 103 of the 141 agencies identified by States/Territories as being involved in Subtitle D activities.

A total of 1,814,439 hours were reported to have been expended in fiscal year 1984 by the 103 agencies for Subtitle D related activities. This total may be a large underestimate for the same reasons cited in Section 4.1 and Section 4.2 (e.g., not all agencies were listed, not all agencies provided information, etc.)

4.5 Types of Subtitle D Activities Engaged In

Each State and Territory was asked to estimate the percent of total hours that were expended in a variety of Subtitle D precoded activity categories. Estimates of time spent on these activities are presented in Table 4.2.

The two types of activities most frequently engaged in were surveillance and enforcement and permitting and licensing. These two activities together accounted for almost 70 percent of all hours expended on Subtitle D activities. Technical assistance activities ranked third, with about 9 percent of the total number of hours expended.

4.6 Importance Rankings for Subtitle D Activities

As an indication of additional needs, each State and Territory was asked to rank the same precoded activity categories described in Section 4.5 (Table 4.2) with respect to those activities that would most improve Subtitle D program effectiveness, assuming additional resources were available. Separate activity rankings were requested for landfills, land application units, and surface impoundments. Study data are

Table 4.2. Percentage of Hours Engaged in Subtitle D Activities

Subtitle D activity	% of Hours	Number of states reporting
1. Surveillance and enforcement	41.1%	46
2. Permitting and licensing	27.8%	46
3. Technical assistance	9.1%	46
4. Planning	5.8%	42
5. Regulation development	4.5%	40
6. Training given	2.8%	30
7. Research	1.5%	16

provided in Table 4.3. The activities in this table are listed in order of overall importance across all three Subtitle D facility types. The rankings of categories for each type of Subtitle D facility appear in the last three columns.

Surveillance and enforcement activities were ranked highest overall, and for each of the three landfill types. Thus, the States and Territories perceive that Subtitle D program effectiveness would be improved most by further expanding the activity that is now most frequently engaged in -- surveillance and enforcement.

Program effectiveness rankings differ somewhat between facility types. Planning is seen as more important and regulation development is seen as less important for landfills than for other facility types. Whereas, regulation development is seen as a higher priority need for surface impoundments than for landfills and land application units.

Table 4.3. Importance Rankings for Subtitle D Activities

Overall Ranking	Subtitle D Activity	Landfills Ranking	Land Application Ranking	Surface Impoundment Ranking
1	Surveillance and enforcement	1	1	1
2	Technical assistance	2	3	2
3	Permitting or licensing	3	2	4
4	Regulation development	5	4	3
5	Training given	6	5	5
6	Planning	4	6	6
7	Research	7	7	7

PART III

NUMBER AND CHARACTERISTICS OF SUBTITLE D WASTE FACILITIES

Section 5. Landfills
Section 6. Land Application Units
Section 7. Surface Impoundments

PART III

NUMBER AND CHARACTERISTICS OF SUBTITLE D WASTE FACILITIES

Part III provides estimates of the number and characteristics of Subtitle D landfills, land application units, and surface impoundments in Sections 5, 6, and 7, respectively. A parallel structure has been used to present data in each of these sections. Each section begins with the definition of facility types. Estimates are then presented with respect to the total number of Subtitle D facilities within each facility type. To properly interpret estimates provided in Sections 5, 6, and 7, the reader is advised to review Part I, Section 2, "Survey Methodology" and Part I, Section 3, "Statistical Reliability," as well as the footnotes presented at the bottom of each figure and table. For some facility types, no estimates of total numbers were available for specific States and Territories. These gaps must be taken into consideration when reviewing estimates of totals for the entire United States.

Following the presentation of estimates of total numbers of facilities by type, each section then contains information regarding the States or Territories that account for a large proportion of all facilities within each facility type. Distributions of facilities on the bases of ownership, acreage, amount of waste, monitoring systems, and design and operational controls are then provided.

The 55 States or Territories in this survey reported a total of 227,127 Subtitle D facilities. Respondents were also asked to report the number of establishments that received Subtitle D wastes. An "establishment" is a single physical location where business is conducted or where services or industrial operations are performed by a municipality, corporation, or other public or private entity. An establishment may have one or more landfills, land applications units, and/or surface impoundments (i.e., one or more facilities). Approximately 120,000 establishments were reported by 46 of the States/Territories. The remaining nine States/Territories did not know how many establishments there were. An additional 32,941 establishments were reported (by 46 States/Territories) that had only closed or inactive Subtitle D facilities in 1984.

5. LANDFILLS

The following estimates are provided in this section:

- An estimate of the total number of Subtitle D landfills in the United States;
- Estimates of the total number of Subtitle D landfills by type;
- Estimates of the total number of Subtitle D landfills by State and EPA region;
- Distributions of the total number of Subtitle D landfills by ownership, acreage, amount of waste, monitoring systems, and design and operational controls; and.
- Landfill capacity problems.

The reader is advised to review the definitions of facility types provided below as well as Section 5.1, "Assessment of Data Quality" when attempting to interpret the estimates provided in this Section.

Definitions:

SUBTITLE D LANDFILL - A part of an establishment at which waste is placed in or on land and which is not a land application unit, a surface impoundment, an injection well, or compost pile.

MUNICIPAL WASTE SUBTITLE D LANDFILL - A landfill that primarily receives household refuse and commercial waste. It may also receive a limited amount of other types of Subtitle D wastes, such as municipal sewage sludge and industrial wastes.

INDUSTRIAL WASTE SUBTITLE D LANDFILL - A landfill that primarily receives waste from factories, processing plants, and other manufacturing activities.

DEMOLITION DEBRIS SUBTITLE D LANDFILL - A landfill that receives only construction or demolition debris (e.g., debris from the construction of or demolition of bridges, highways, or buildings), brush, stumps, and rubble.

OTHER SUBTITLE D LANDFILL - A landfill receiving Subtitle D wastes that does not fall into any of the above categories (e.g., a landfill that receives only municipal sewage sludge).

5.1 Assessment of Data Quality

The estimated numbers of active Subtitle D landfills in 1984 that are presented below do not include the following:

- Estimates of industrial waste landfills in Massachusetts or Montana; or
- Estimates of the total number of demolition debris landfills in Ohio.

Overall, the quality of the data regarding municipal waste landfills appears to be good. Industrial waste estimates were more difficult to provide by the States/Territories for a number of reasons: some States do not have permitting requirements for industrial waste landfills if the waste is generated on-site and disposed of on-site; record-keeping and monitoring systems suffer from a lack of staff or manpower, etc. In general, the estimate of industrial waste landfills is likely to be an underestimate to an unknown degree. Demolition debris landfill estimates are likely to fall somewhere between the high quality of the municipal waste landfill estimates and the lower quality of the industrial waste estimates.

5.2 Estimated Number of Active Subtitle D Landfills in 1984

The total estimated number of active Subtitle D landfills in 1984 produced as a result of this study is 16,416 (55 States/Territories reporting). A breakdown of the total number of landfills by type is presented in Figure 5.1. The number of establishments that had at least one landfill is 15,719 (52 States/Territories reporting).

There were an estimated 9,284 active municipal waste landfills in 1984, accounting for 56.6 percent of the total. There were an estimated 3,511 industrial waste landfills, representing 21.4 percent of the total. There were an estimated 2,591 demolition debris landfills, representing 15.8 percent of the total. There were also 1,030 landfills reported as "other", accounting for 6.3 percent of the total number of active Subtitle D landfills in 1984. The "other" category was made up of 838 open dumps and 192 miscellaneous landfills (yard trash, junk cars, animal carcasses, and water treatment sludges).

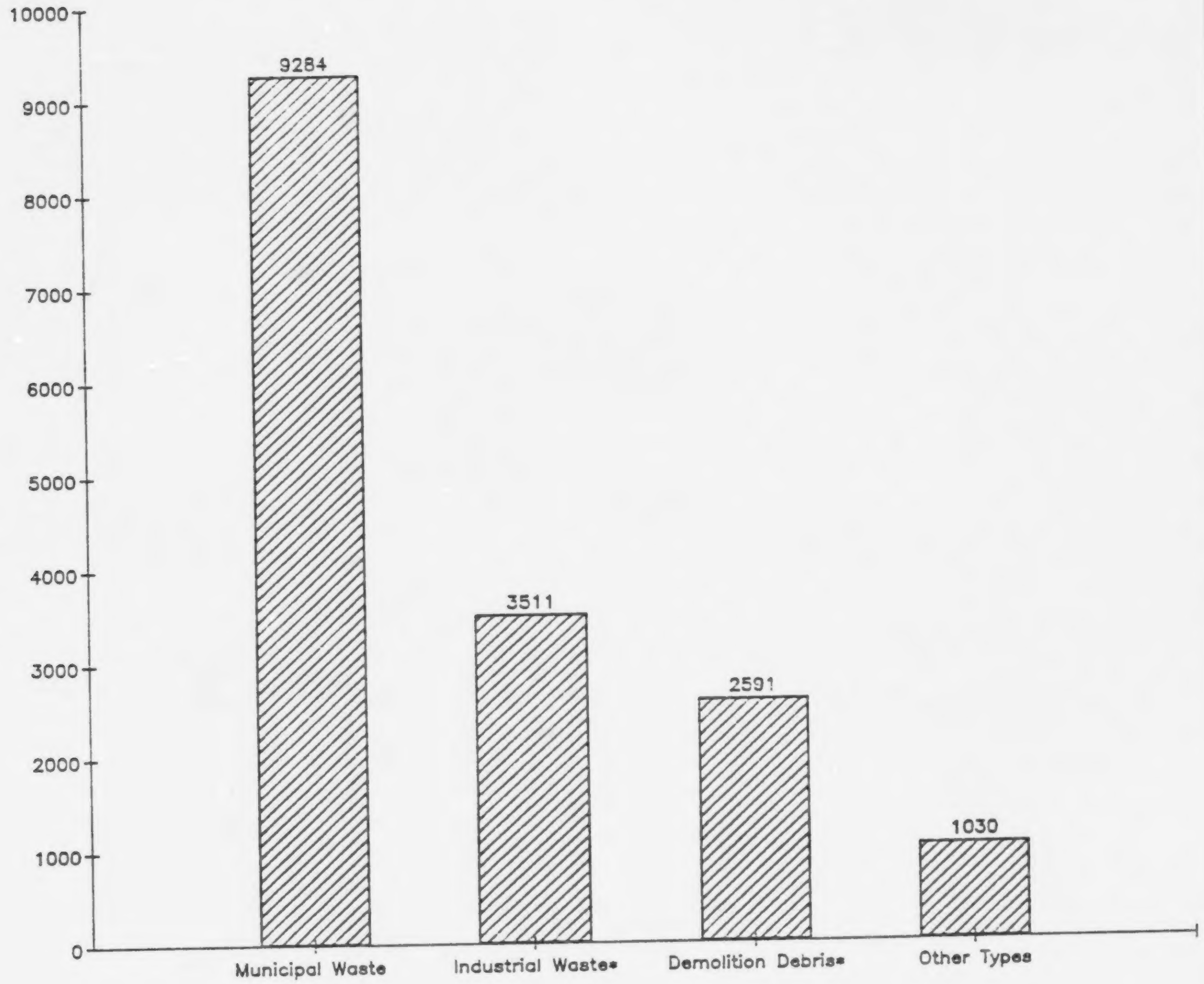
5.3 Estimated Number of Landfills by State and EPA Region

The total estimated number of active Subtitle D landfills in 1984 for each State and Territory is shown in the map presented in Figure 5.2. West Virginia (1,209) has the highest number of reported Subtitle D landfills, followed by Pennsylvania (1,204), Texas (1,201), Wisconsin (1,033), Alabama (800), Alaska (740), and California (720). The total number of landfills in the State of West Virginia includes 550 "open dumps" included in the "other" category.

Figure 5.3 presents the five States that account for the largest percentage of the total number of landfills in each

Figure 5.1
NUMBER OF SUBTITLE D LANDFILLS BY TYPE

Total Estimated Number of Subtitle D Landfills = 16,416*



* No estimates of industrial waste landfills were obtained for Massachusetts or Montana; and no estimates of demolition debris landfills were obtained for Ohio.

Figure 5.2

NUMBER OF SUBTITLE D LANDFILLS BY STATE/TERRITORY

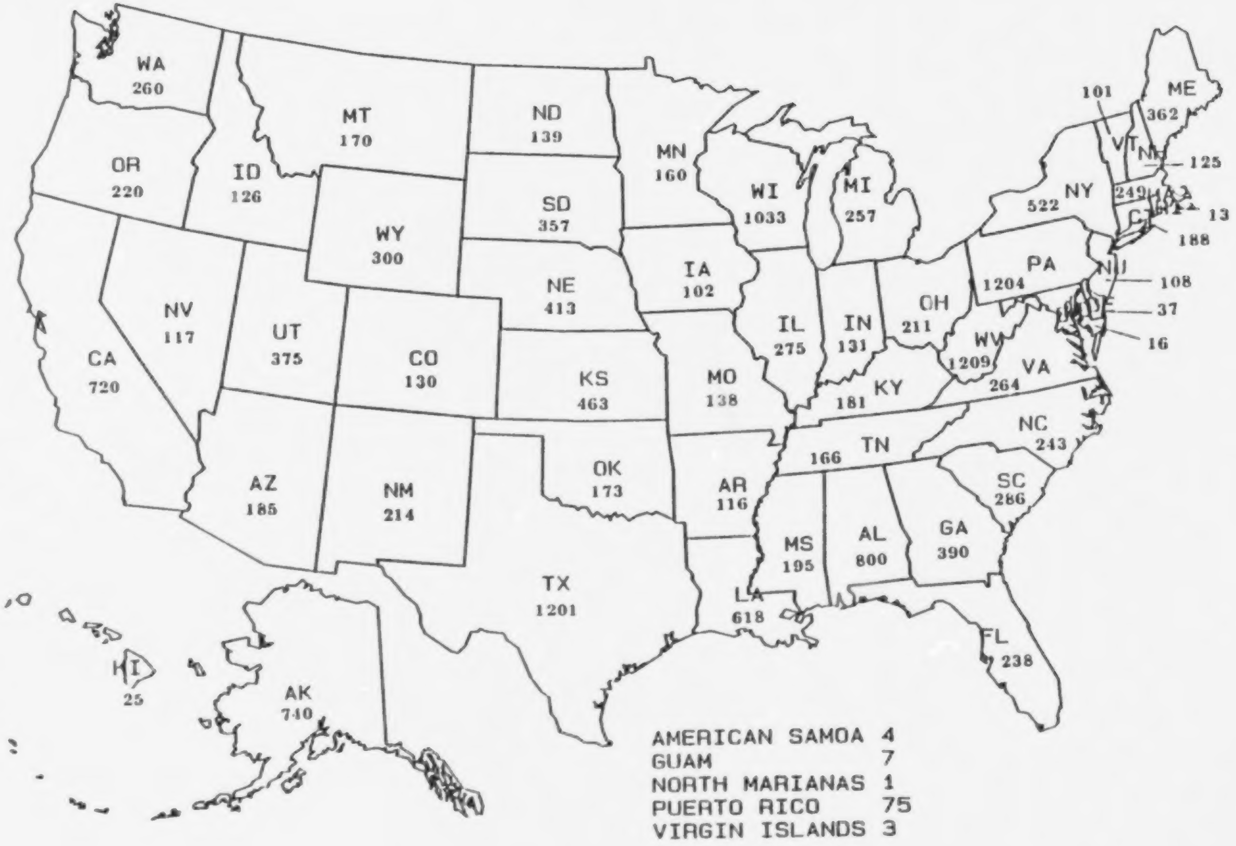
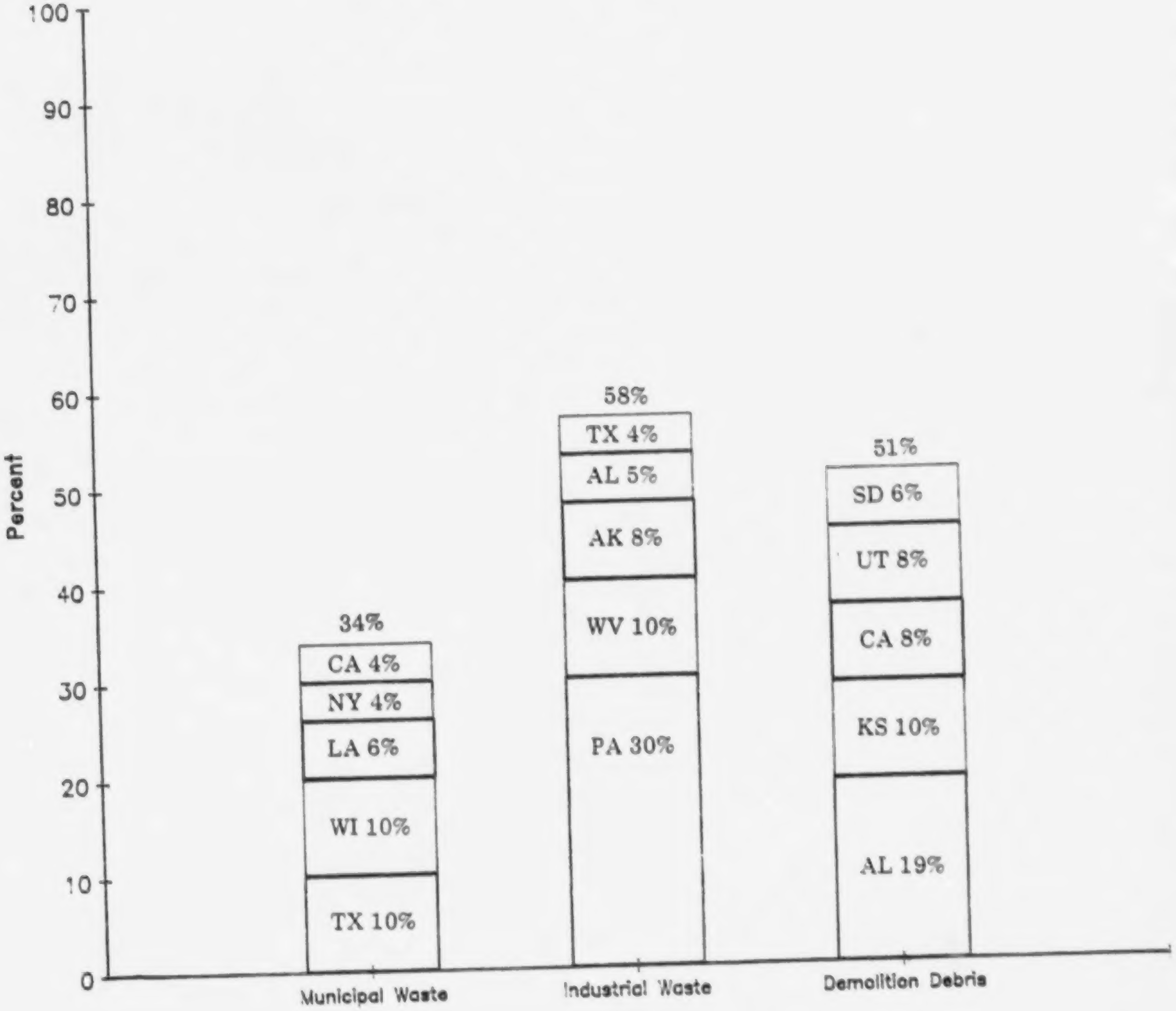


Figure 5.3
PERCENTAGE ACCOUNTED FOR BY THE FIVE STATES WITH THE LARGEST NUMBER OF LANDFILLS BY TYPE



landfill type. Texas (949), Wisconsin (916), Louisiana (520), New York (399), and California (382) account for a total of 34 percent of all municipal waste landfills. Pennsylvania (1,062), alone, accounts for 30 percent of all industrial waste landfills, while West Virginia (358), Alaska (268), Alabama (176), and Texas (157) account for an additional 28 percent of all industrial waste landfills. Alabama (500), Kansas (267), California (200), Utah (200), and South Dakota (150) account for 51 percent of all demolition debris landfills.

The total estimated number of Subtitle D landfills by EPA Region is presented in Figure 5.4. EPA Region III (2,790) contains the largest number of landfills, followed by Region IV and Region VI.

5.4 Basic Characteristics of Subtitle D Landfills

5.4.1 Ownership

Ownership was reported for 15,578 (95%) of the 16,416 Subtitle D landfills as shown in Table 5.1. Ownership could not be determined for 838 landfills. It should be noted that ownership is often difficult to determine because of leasing/ contractual arrangements. In total, local governments own approximately 54 percent of all Subtitle D landfills. Private owners account for 40.5 percent, while federal (4.0%) and State governments (1.7%) account for only a small portion of the total. Federal ownership was reported primarily when land owned by the federal government (e.g., Bureau of Land Management) was leased for the operation of a landfill. The "other" ownership category included only 10 landfills or 0.1 percent of the total.

Figure 5.4
NUMBER OF SUBTITLE D LANDFILLS BY EPA REGION

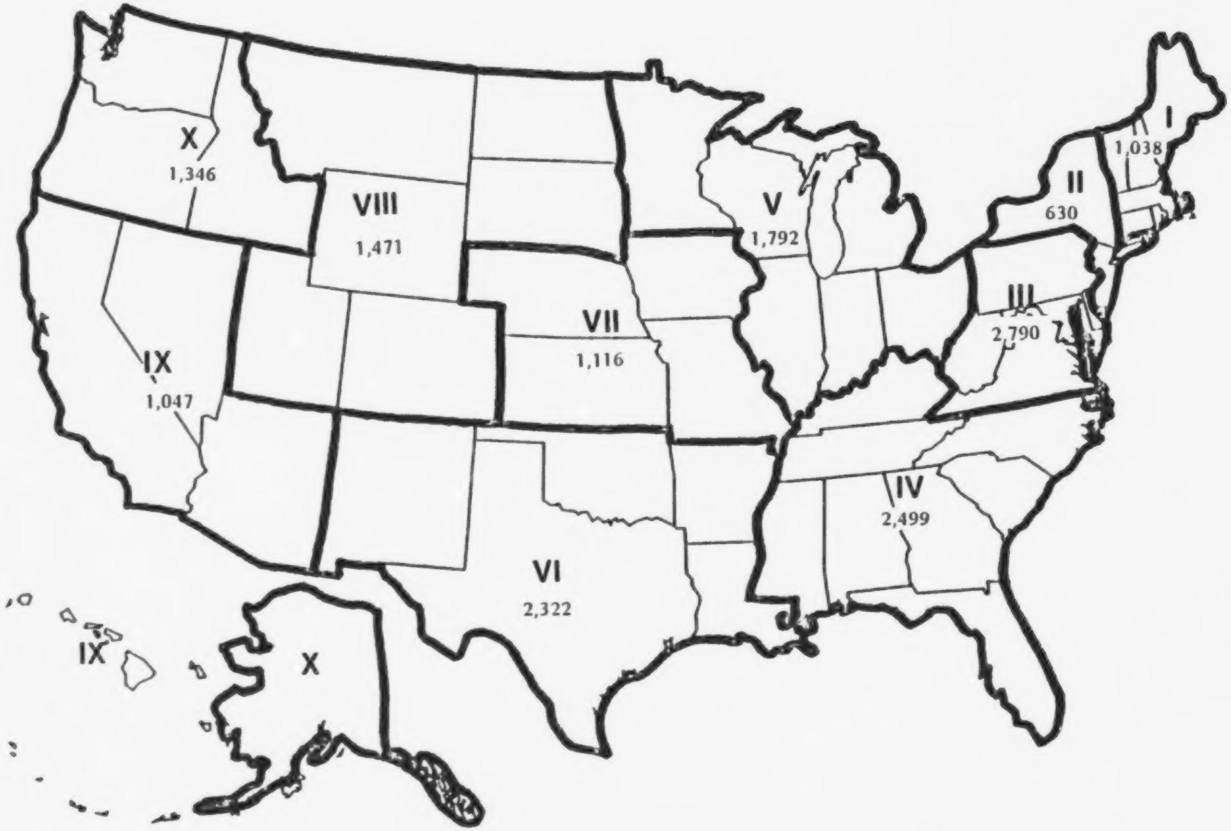


Table 5.1. Number of Subtitle D landfills by ownership category

		Number and percent of active individual Subtitle D landfills					
Landfill type	Response rate	Owned by State government	Owned by local governments	Owned by Federal government	Privately owned	Other	TOTAL
Municipal waste	96%	126 (1.4%)	6,908 (77.9%)	348 (3.9%)	1,482 (16.7%)	8 (0.1%)	8,872 (100%)
Industrial waste	97%	17 (0.5%)	74 (2.2%)	126 (3.7%)	3,177 (93.6%)	2 (0.1%)	3,396 (100%)
Demolition debris only	91%	33 (1.4%)	1,190 (50.5%)	82 (3.5%)	1,050 (44.6%)	0	2,355 (100%)
Other	93%	89 (9.3%)	203 (21.3%)	60 (6.3%)	603 (63.1%)	0	955 (100%)
TOTAL	95%	265 (1.7%)	8,375 (53.8%)	616 (4.0%)	6,312 (40.5%)	10 (0.1%)	15,578 (100%)

Note: Percentages may not sum to 100 percent due to independent rounding.

Local governments owned the majority of municipal waste landfills (77.9%), although a total of 1,482 municipal waste landfills (16.7%) were reported to be privately owned. The next majority (94%) of all industrial waste landfills were reported to be privately owned. Demolition debris landfills were split somewhat equally between local government owners (50.5%) and private owners (44.6%). The majority of landfills in the "other" category were said to be privately owned (63.1%).

5.4.2 Acreage

Acreage was reported for 13,143 (80%) of the 16,416 Subtitle D landfills as shown in Table 5.2. Acreage categories could not be determined for 3,273 landfills. In total, 7,284 landfills (55.4%) were reported to be less than 10 acres; 5,273 landfills (40.1%) were reported to be between 10 and 100 acres; 586 landfills (4.5%) were reported to be over 100 acres. Industrial waste landfills were generally smaller than municipal waste and demolition debris landfills. The vast majority (92.1%) of the landfills in the "other" category were reported to be less than 10 acres.

5.4.3 Amount of Waste

Amount of waste was reported for 13,818 (84%) of the 16,416 Subtitle D landfills as shown in Table 5.3. The amount of waste category could not be determined for 2,598 landfills. In total, 9,996 landfills (72.3%) were said to have received less than 30,000 cubic yards of waste; 3,253 landfills (23.5%) were said to have received between 30,000 and 600,000 cubic yards of waste; 569 landfills (4.1%) were said to have received more than 600,000 cubic yards of waste. Industrial waste and demolition

Table 5.2. Number of Subtitle D landfills by acreage category

		Number and percent of active individual Subtitle D landfills with:			
Landfill type	Response rate	Less than 10 acres	10-100 acres	More than 100 acres	TOTAL
Municipal waste	75%	2,944 (42.3%)	3,572 (51.3%)	449 (6.4%)	6,965 (100%)
Industrial waste	88%	2,182 (70.7%)	834 (27.0%)	72 (2.3%)	3,088 (100%)
Demolition debris only	84%	1,327 (60.6%)	797 (36.4%)	64 (2.9%)	2,188 (100%)
Other	88%	831 (92.1%)	70 (7.8%)	1 (1.1%)	902 (100%)
TOTAL	80%	7,284 (55.4%)	5,273 (40.1%)	586 (4.5%)	13,143 (100%)

Note: Percentages may not sum to 100 percent due to independent rounding.

Table 5.3. Number of Subtitle D landfills by amount of waste

		Number and percent of active individual Subtitle D landfills by amount of waste received in 1984:			
Landfill type	Response rate	Received less than 30,000 cubic yards in 1984 (30 tons per day)	Received 30,000-600,000 cubic yards in 1984 (30-500 tons per day)	Received more than 600,000 cubic yards in 1984 (500 tons per day)	TOTAL
Municipal waste	85%	5,309 (67.0%)	2,211 (27.9%)	408 (5.1%)	7,928 (100%)
Industrial waste	82%	2,289 (79.4%)	523 (18.1%)	72 (2.5%)	2,884 (100%)
Demolition debris only	83%	1,608 (74.7%)	468 (21.7%)	78 (3.6%)	2,154 (100%)
Other	83%	790 (92.7%)	51 (6.0%)	11 (1.3%)	852 (100%)
TOTAL	84%	9,996 (72.3%)	3,253 (23.5%)	569 (4.1%)	13,818 (100%)

Note: Percentages may not sum to 100 percent due to independent rounding.

debris landfills generally received somewhat less waste than municipal waste landfills. The vast majority (92.7%) of the landfills in the "other" category were reported to have received less than 30,000 cubic yards of waste in 1984.

5.4.4. Landfill Monitoring Systems

The number of Subtitle D landfills that had groundwater, surface water, air emissions, and methane monitoring systems is presented in Table 5.4. The percentages given in this table represent the total number of landfills having a monitoring system divided by the total number of landfills reported above (e.g., 2,160 municipal landfills were reported to have groundwater monitoring systems out of a total of 9,284 municipal landfills. Thus, 25.1 percent of all municipal landfills are estimated to have groundwater monitoring systems).

In total, approximately 19 percent of all Subtitle D landfills had groundwater monitoring systems, about 9 percent had surface water monitoring systems, and about 3 percent had air emissions and methane monitoring systems. Demolition debris landfills, as expected because of the types of waste which they contain, generally have many fewer monitoring systems than do municipal and industrial waste landfills.

5.4.5 Landfill Design and Operational Controls

The number of Subtitle D landfills that had various design and operational controls is presented in Table 5.5. Only 119 landfills or 0.7 percent of all Subtitle D landfills were known to have synthetic liners in 1984. Approximately 11 percent were known to have natural liners. Approximately 39 percent of

Table 5.4. Number of Subtitle D landfills having monitoring systems

Landfill type	Number and percent of active individual Subtitle D landfills that had:			
	Groundwater monitoring	Surface water monitoring	Air emissions monitoring	Methane monitoring
Municipal waste	2,331 (25.1%)	1,100 (11.8%)	348 (3.7%)	427 (4.6%)
Industrial waste	626 (17.8%)	230 (6.6%)	80 (2.3%)	63 (1.8%)
Demolition debris only	135 (5.2%)	69 (2.7%)	7 (0.3%)	8 (0.3%)
Other	42 (4.1%)	16 (1.6%)	0	0
TOTAL	3,134 (19.1%)	1,415 (8.6%)	445 (2.7%)	498 (3.0%)

Table 5.5. Number of Subtitle D landfills having design and operational controls

Design or operational control	Number and percent of active individual Subtitle D landfills: Municipal waste	Industrial waste	Demolition debris only	Other	TOTAL
Synthetic liners	71 (0.8%)	45 (1.3%)	1 (<.1%)	2 (0.2%)	119 (0.7%)
Natural liners (e.g., clay), including slurry walls	1,353 (14.6%)	392 (11.2%)	117 (4.5%)	5 (0.5%)	1,867 (11.4%)
Natural renovation (i.e., leachate attenuation)	3,627 (39.1%)	657 (18.7%)	541 (20.9%)	52 (5.0%)	4,877 (29.7%)
Leachate collection systems	481 (5.2%)	112 (3.2%)	3 (0.1%)	6 (0.6%)	602 (3.7%)
Leachate treatment (except leachate recirculation)	245 (2.6%)	69 (2.0%)	1 (<.1%)	2 (0.2%)	317 (1.9%)
Leachate recirculation	205 (2.2%)	27 (0.8%)	0	0	232 (1.4%)
Run-on/run-off controls	4,240 (45.7%)	1,150 (32.8%)	685 (26.4%)	78 (7.6%)	6,153 (37.5%)
Methane controls (vents, recovery)	1,539 (16.6%)	98 (2.8%)	107 (4.1%)	3 (0.3%)	1,747 (10.6%)
Restrictions on receipt of liquid waste (e.g., bulk liquid restrictions)	4,436 (47.8%)	1,200 (34.2%)	818 (31.6%)	128 (12.4%)	6,582 (40.1%)

municipal waste landfills and 30 percent of all Subtitle D landfills were known to have natural renovation or leachate attenuation in 1984. Only very small percentages of landfills were said to have leachate collection, leachate treatment, and leachate recirculation systems. The most frequently reported design and operational controls were restrictions on receipt of liquid wastes and run-on/run-off controls. Methane controls (vents, recovery) were known to exist in approximately 11 percent of all Subtitle D landfills in 1984.

5.4.6 Landfill Capacity Problems

Each respondent was asked to describe any local, regional, or Statewide landfill capacity problems that existed in their State or Territory. This question was asked in a somewhat different way during the pretest of the questionnaire. In the pretest, respondents were asked to provide an estimate of the landfill capacity in their State. This was difficult to provide and the question was rewritten as an open-ended question. Based on telephone conversations with the respondents, many perceived the question as pertaining to municipal landfills only. The actual responses received from the States are listed in Appendix A.

In general, many States reported that some landfills in their jurisdictions were either reaching capacity, at capacity, or beyond capacity at the present time. A few States and Territories reported that they had no landfill capacity problems.

A majority of the responses mentioned that there were difficulties in siting new landfills. Some States described public opposition to the siting of new landfills as a significant obstacle. Some States reported that finding suitable land on which to place the landfill was also a severe roadblock to the siting of new landfill facilities. Tougher permitting requirements and rising costs were mentioned as a difficulty in siting new landfills. Difficulties in developing alternatives to landfills because of the time, cost and technology involved were also mentioned.

In general, a landfill capacity problem was reported to exist within certain regions of many States and Territories. New sites for landfills were said to be difficult to obtain, highly opposed by the public, and costly. Some States said that incinerators and resource recovery plants represent promising future alternatives to landfills, but not viable alternatives for solving immediate capacity problems.

6. LAND APPLICATION UNITS

The following estimates are provided in this section:

- An estimate of the total number of Subtitle D land application units in the United States;
- Estimates of the total number of Subtitle D land application units by type;
- Estimates of the total number of Subtitle D land application units by State and EPA region; and
- Distributions of the total number of Subtitle D land application units by ownership, acreage, amount of waste, monitoring systems, and design and operational controls.

The reader is advised to review the definitions of facility types provided below as well as Section 6.1, "Assessment of Data Quality" when attempting to interpret the estimates provided in this section.

Definitions:

SUBTITLE D LAND APPLICATION UNIT - A part of an establishment at which waste is applied onto or incorporated into the soil surface for the purpose of beneficial use or waste treatment and disposal. Land application is often referred to as landfarming or landspreading. Specifically excluded from this definition are manure spreading operations.

MUNICIPAL SEWAGE SLUDGE SUBTITLE D LAND APPLICATION UNIT - A land application unit that primarily receives sewage sludge from publicly-owned or privately-owned domestic sewage treatment facilities, including sludge from domestic septic tanks. (Note: do not include municipal wastewater land application units in this category - these are not included in the scope of this survey.)

HIGH APPLICATION RATE UNITS - Municipal sewage sludge land application units where the application rate exceeds the nutrient needs of crops, for reclamation of disturbed lands, waste treatment or disposal.

LOW APPLICATION RATE UNITS - Municipal sewage sludge land application units where the application rate is based on crop nutrient needs.

INDUSTRIAL WASTE LAND APPLICATION UNIT - A land application unit that primarily receives waste (including sludge or wastewater) from factories, processing plants, and other manufacturing or commercial activities.

OIL OR GAS LAND APPLICATION UNIT - A land application unit that receives waste, such as drilling muds, generated by oil or gas exploration and extraction operations.

OTHER LAND APPLICATION UNIT - A land application unit receiving Subtitle D wastes that does not fall into any of the above categories (e.g., a drinking water treatment waste land application unit).

6.1 Assessment of Data Quality

The estimated numbers of active Subtitle D land application units in 1984 that are presented below do not include the following:

- Estimates of the total number of municipal sewage sludge LAU's in Illinois, Louisiana, Missouri, Utah, or West Virginia;
- Estimates of industrial waste LAU's in Illinois, Louisiana, Missouri, or Montana; or
- Estimates of oil or gas waste LAU's in Illinois, Missouri, or Montana.

Respondent ratings of the quality of data and land application unit total numbers were frequently in the fair, poor, or very poor range.

6.2 Estimated Number of Active Subtitle D Land Application Units in 1984

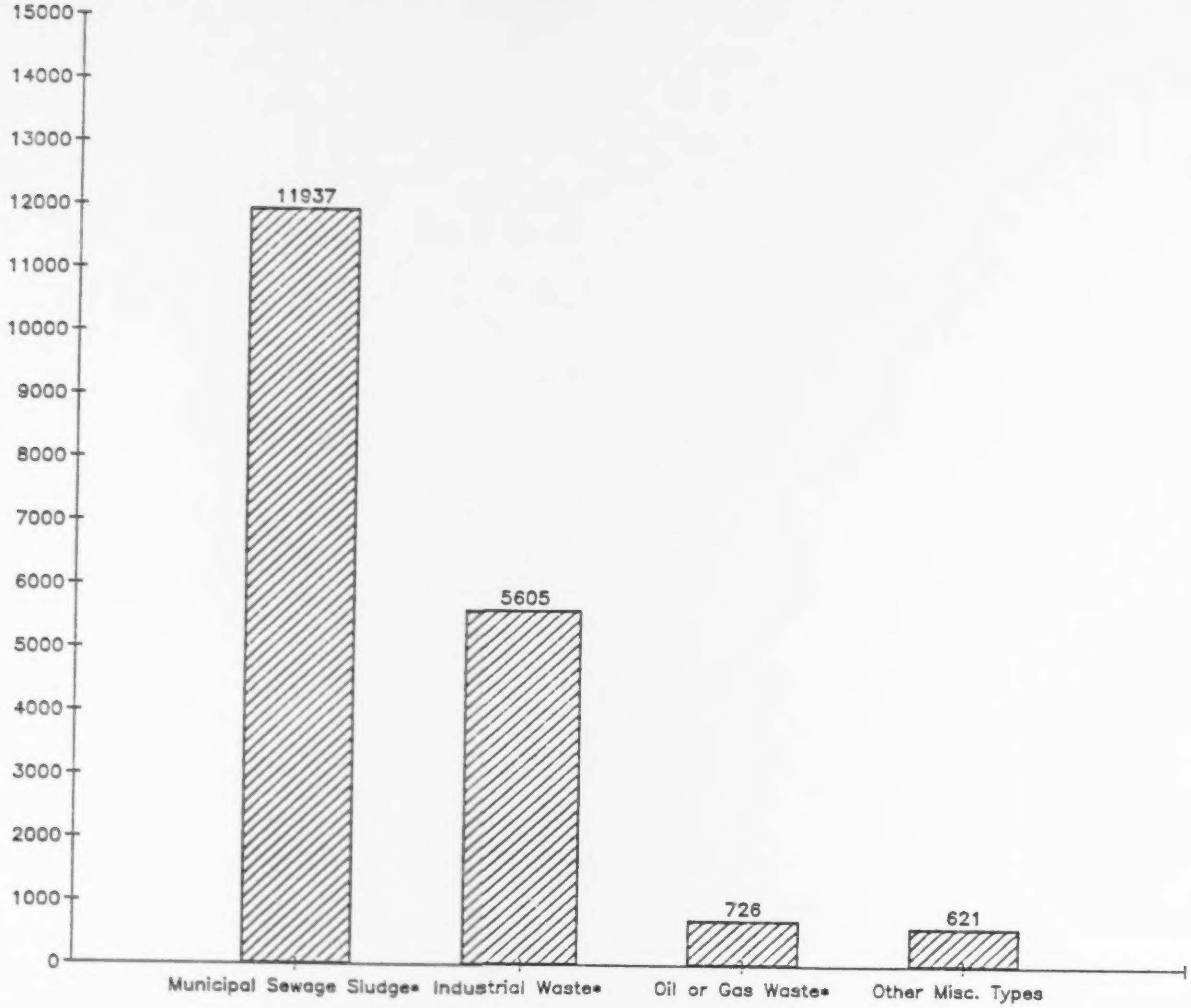
The total estimated number of active Subtitle D land application units (LAU's) in 1984 produced as a result of this study is 18,889 (51 States/Territories reporting). A breakdown of the total number of LAU's by type is presented in Figure 6.1. The number of establishments that had at least one land application unit is 12,312 (47 States/Territories reporting).

There were an estimated 11,937 municipal sewage sludge LAU's, accounting for 63.2 percent of all LAU's reported. Only 242 municipal sewage sludge LAU's were said to have high application rates exceeding the nutrient needs of crops. The vast majority of these sludges were applied for the reclamation of disturbed lands. There were an estimated 5,605 active industrial waste LAU's in 1984, representing 29.7 percent of all LAU's reported. A relatively small number of oil or gas waste LAU's (726; 3.8% of the total) and "other" LAU's (621; 3.3% of the total) were also reported. The "other" category contains 451 animal waste and 170 water treatment sludge LAU's.

6.3 Estimated Number of Land Application Units by State and EPA Region

The total estimated number of active Subtitle D land application units in 1984 for each State and Territory is shown on the map presented in Figure 6.2. Wisconsin (4,181) has the

Figure 6.1
NUMBER OF SUBTITLE D APPLICATION UNITS BY TYPE

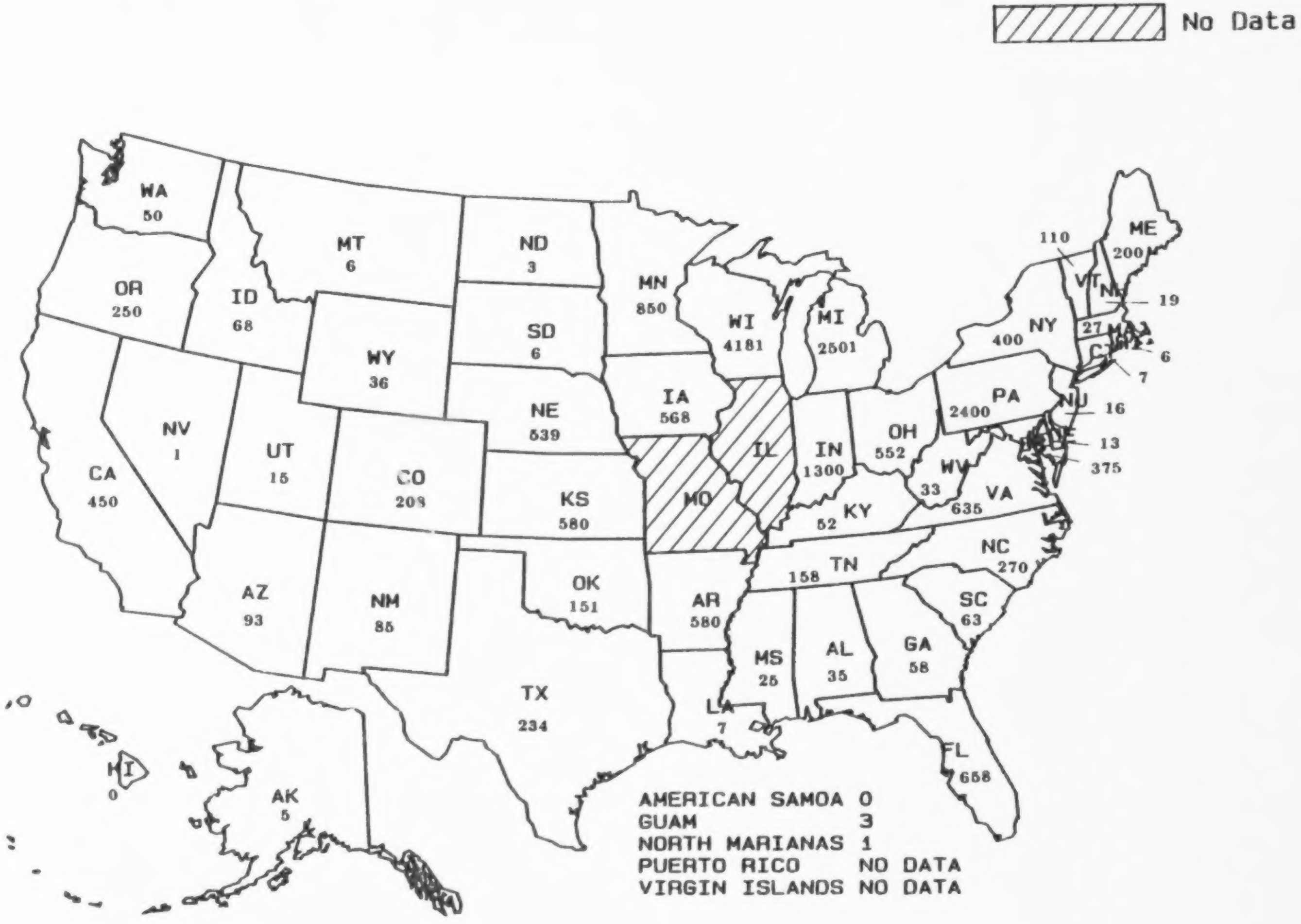


Total Estimated Number of Subtitle D Land Application Units = 18,889*

* No estimates of municipal sewage sludge land application units obtained for Illinois, Louisiana, Missouri, or West Virginia; no estimates of industrial waste land application units obtained for IL, LA, MO, or MT; no estimates of oil or gas waste land application units obtained for IL, MO, or MT.

Figure 6.2

NUMBER OF LAND APPLICATION UNITS BY STATE/TERRITORY



AMERICAN SAMOA	0
GUAM	3
NORTH MARIANAS	1
PUERTO RICO	NO DATA
VIRGIN ISLANDS	NO DATA

highest number of reported Subtitle D LAU's, followed by Michigan (2,501), Pennsylvania (2,400), Indiana (1,300), and Minnesota (850).

Figure 6.3 presents the five States that account for the largest percentage of the total number of LAU's within each LAU type. Pennsylvania (2,229), Michigan (1,601), Indiana (1,042), Wisconsin (940), and Minnesota (800) account for 55 percent of all municipal sewage sludge LAU's. The majority of industrial waste LAU's are found in Wisconsin (3,241), accounting for 58 percent of the total, while Michigan (900), Indiana (225), North Carolina (215), and Maryland (125) account for another 26 percent. The majority of oil or gas waste LAU's are found in Nebraska, accounting for 59 percent of the total, while California (100) and Texas (75) account for another 24 percent.

The total estimated number of Subtitle D land application units is presented by EPA Region in Figure 6.4. Almost half (9,344) of all LAU's were reported to be in EPA Region V, followed by Region III (3,456) and Region VII (1,687).

6.4 Basic Characteristics of Subtitle D Land Application Units

6.4.1 Ownership

Ownership was reported for 18,782 (99%) of the 18,889 land application units as shown in Table 6.1. The vast majority of all types of LAU's are privately owned. Local governments own approximately 13 percent of all total municipal sewage sludge LAU's.

Figure 6.3
PERCENTAGE ACCOUNTED FOR BY THE FIVE STATES WITH THE LARGEST NUMBER OF LAND APPLICATION UNITS BY TYPE

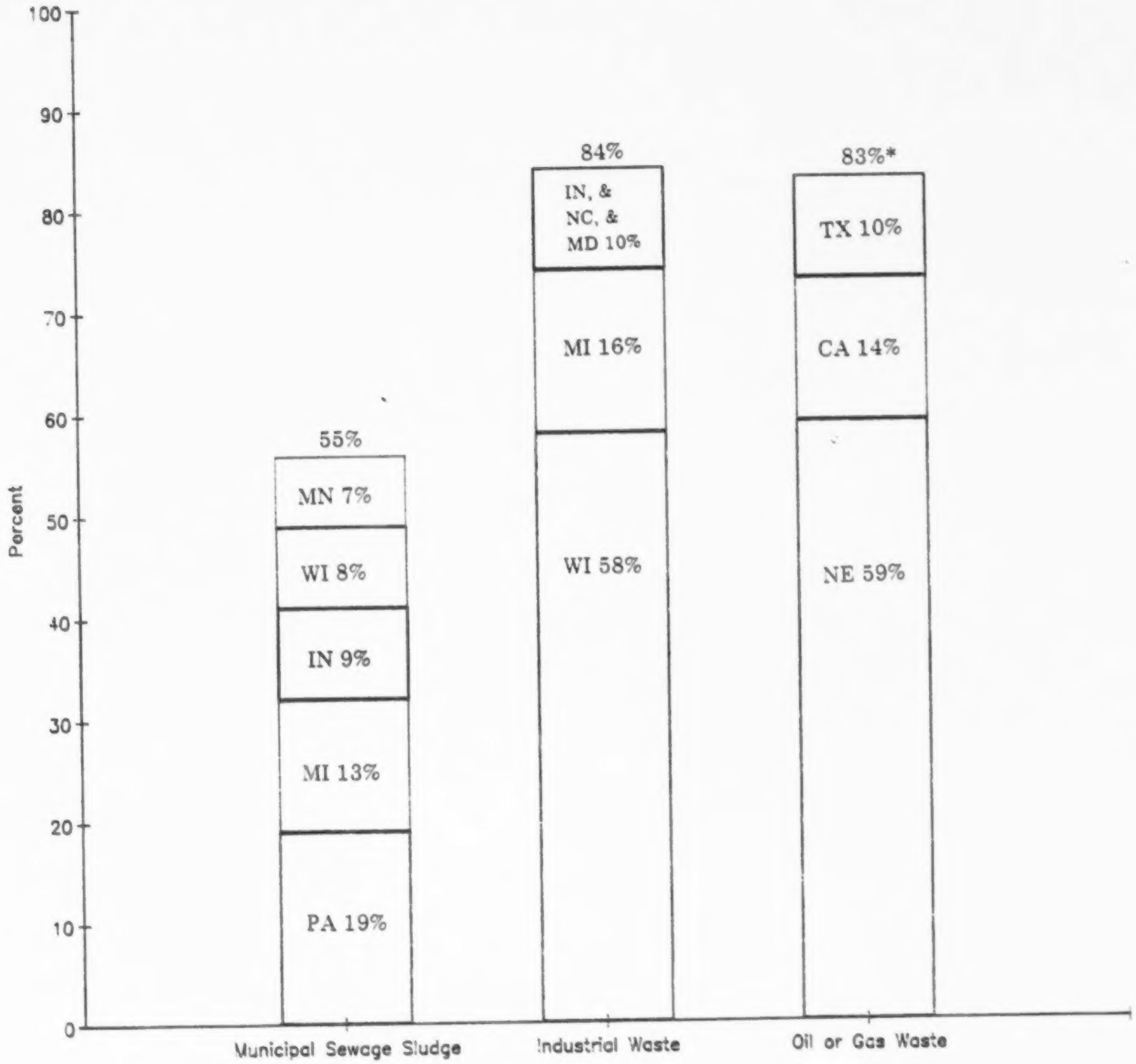


Figure 6.4
NUMBER OF SUBTITLE D LAND APPLICATION UNITS BY EPA REGION

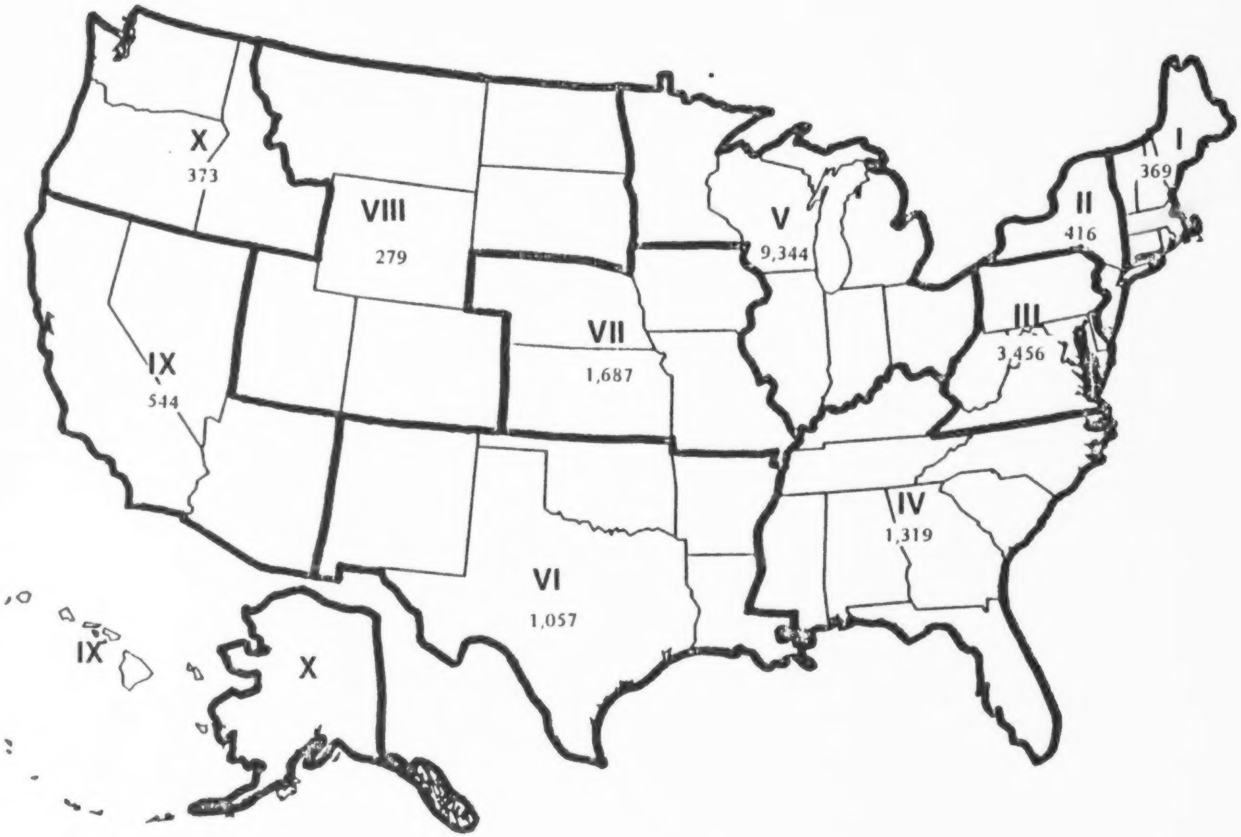


Table 6.1. Number of Subtitle D land application units by ownership category

Land application unit type	Response rate	Number and percent of active individual Subtitle D land application units					
		Owned by State government	Owned by local governments	Owned by Federal government	Privately owned	Other	TOTAL
Municipal sewage sludge at high application rate*	98%	2 (0.8%)	48 (20.3%)	0	187 (78.9%)	0	237 (100%)
Municipal sewage sludge at low application rate*	99%	72 (0.7%)	1,028 (10.6%)	17 (0.2%)	8,570 (88.5%)	0	9,687 (100%)
Total municipal sewage sludge*	99%	104 (0.9%)	1,524 (12.9%)	72 (0.6%)	10,145 (85.6%)	0	11,845 (100%)
Industrial waste	99%	1 (0.1%)	18 (0.3%)	13 (0.2%)	5,558 (99.4%)	0	5,590 (100%)
Oil or gas waste	100%	1 (0.1%)	6 (0.8%)	16 (2.2%)	703 (96.8%)	0	726 (100%)
Other	100%	10 (1.6%)	26 (4.2%)	9 (1.4%)	576 (92.8%)	0	621 (100%)
TOTAL	99%	116 (0.3%)	1,574 (8.4%)	110 (0.6%)	16,982 (90.4%)	0	18,782 (100%)

*High rate application and low rate application do not equal the total municipal sewage sludge figures because some states do not distinquish between high and low application rates.

Note: Percentages may not sum to 100 percent due to independent rounding.

6.4.2 Acreage

Acreage was reported for 15,576 (82%) of the 18,889 land application units as shown in Table 6.2. In total, there were 2,347 LAU's of 100 acres or more; 3,301 LAU's of 50-99 acres; 6,448 LAU's of 10-49 acres; and 3,480 LAU's of less than 10 acres. Oil or gas waste LAU's were generally small, while LAU's classified as "other" were generally large.

6.4.3 Amount of Waste

Amount of waste was reported for 12,020 (63%) of the 18,889 land application units as shown in Table 6.3. The majority of the LAU's (70.0%) received less than 50 tons of waste (dry weight) in 1984, although a high percentage of oil or gas waste LAU's (79.8%) received 100-999 tons of waste. Over 90 percent of industrial waste LAU's received less than 50 tons of waste in 1984.

6.4.4 Land Application Unit Monitoring Systems

The number of Subtitle D land application units that had groundwater, surface water, air, and soil monitoring systems is presented in Table 6.4. The percentages given in this table represent the total number of land application units having a monitoring system divided by the total number of land application units reported above (e.g., 43 high application rate municipal sewage sludge LAU's were reported to have groundwater monitoring systems out of a total of 242 high application municipal sewage sludge LAU's. Thus, 17.8 percent of all high rate LAU's are estimated to have groundwater monitoring systems).

Table 6.2. Number of Subtitle D land application units by acreage category

		Number and percent of active individual Subtitle D land application units with:					
Land application unit type	Response rate	Less than 10 acres	10 - 49 acres	50 - 99 acres	100 acres or more	TOTAL	TOTAL ACREAGE
Municipal sewage sludge at high application rate	98%	96 (40.7%)	57 (24.2%)	64 (27.1%)	19 (8.0%)	236 (100%)	5,370
Municipal sewage sludge at low application rate	78%	1,503 (19.6%)	3,339 (43.6%)	1,476 (19.3%)	1,336 (17.5%)	7,654 (100%)	210,154
Total municipal sewage sludge*	82%	2,077 (21.2%)	4,567 (46.5%)	1,789 (18.2%)	1,378 (14.0%)	9,811 (100%)	262,184
Industrial waste	96%	681 (15.4%)	1,805 (40.9%)	1,462 (33.1%)	470 (10.6%)	4,418 (100%)	152,869
Oil or gas waste	100%	568 (78.2%)	69 (9.5%)	44 (6.1%)	45 (6.2%)	726 (100%)	9,078
Other	100%	154 (24.8%)	7 (1.1%)	6 (1.0%)	454 (73.1%)	621 (100%)	68,703
TOTAL	82%	3,480 (22.3%)	6,448 (41.4%)	3,301 (21.1%)	2,347 (15.1%)	15,576 (100%)	492,834

*High rate application and low rate application do not equal the total municipal sewage sludge figures because some states do not distinquish between high and low application rates.

Note: Percentages may not sum to 100 percent due to independent rounding. The response rate for the total acreage question was somewhat lower than for the rest of the questions and may be an underestimate.

Table 6.3. Number of Subtitle D land application units by amount of waste

Land application unit type	Response rate	Number of active individual Subtitle D land application units by amount of waste received in 1984: Received less than 50 tons per year (dry weight)	Received 50 - 99 tons per year (dry weight)	Received 100 - 999 tons per year (dry weight)	Received 1,000 or more tons per year (dry weight)	TOTAL
Municipal sewage sludge at high application rate	32%	20 (26.0%)	24 (31.2%)	5 (6.5%)	28 (36.4%)	77 (100%)
Municipal sewage sludge at low application rate	52%	2,727 (53.9%)	958 (18.9%)	1,050 (20.8%)	321 (6.3%)	5,056 (100%)
Total municipal sewage sludge*	57%	4,276 (63.3%)	1,043 (15.4%)	1,080 (16.0%)	355 (5.3%)	6,754 (100%)
Industrial waste	81%	3,740 (91.3%)	174 (4.2%)	151 (3.7%)	30 (0.7%)	4,095 (100%)
Oil or gas waste	76%	81 (14.7%)	22 (4.0%)	439 (79.8%)	8 (1.5%)	550 (100%)
Other	100%	319 (51.4%)	151 (24.3%)	151 (24.3%)	0	621 (100%)
TOTAL	64%	8,416 (70.0%)	1,390 (11.6%)	1,821 (15.1%)	393 (3.3%)	12,020 (100%)

*High rate application and low rate application do not equal the total municipal sludge figures because some states do not distinguish between high and low application rates.

Note: Percentages may not sum to 100 percent due to independent rounding.

Table 6.4. Number of Subtitle D land application units having monitoring systems

Land application unit type	Number and percent of active individual Subtitle D land application units that had:			
	Groundwater monitoring	Surface water monitoring	Air monitoring	Soil monitoring
Municipal sewage sludge at high application rate	43 (17.8%)	16 (6.6%)	0	206 (85.1%)
Municipal sewage sludge at low application rate	170 (1.7%)	74 (0.8%)	0	4,517 (46.2%)
Total municipal sewage sludge*	337 (2.8%)	265 (2.2%)	100 (0.8%)	4,804 (40.2%)
Industrial waste	592 (10.6%)	137 (2.4%)	31 (0.6%)	204 (3.6%)
Oil or gas waste	247 (34.0%)	230 (31.7%)	37 (5.1%)	42 (5.8%)
Other	3 (0.5%)	0	0	3 (0.5%)
TOTAL	1,179 (6.2%)	632 (3.3%)	168 (0.9%)	5,053 (26.8%)

*High rate application and low rate application may not equal the total municipal sewage sludge figures because some states do not distinguish between high and low rate land application units.

In total, about 27 percent of all land application units had soil monitoring; approximately 46 percent of the municipal sewage sludge at low application rate had soil monitoring, while only about 4 percent of the industrial waste LAU's and 6 percent of the oil or gas waste LAU's had soil monitoring. Groundwater monitoring systems were reported for only 6.2 percent of the total number of LAU's, however; more than 10 percent of the industrial waste LAU'S and 34 percent of the oil or gas waste LAU's had groundwater monitoring. Approximately 32 percent of the oil or gas waste LAU's also had surface water monitoring, while in total, surface water monitoring was reported for only 3.3 percent of all LAU's. Air monitoring was reported for less than 1 percent of all LAU's.

6.4.5 Land Application Unit Design and Operational Controls

The number of Subtitle D land application units that had various design and operational controls is presented in Table 6.5. In total, 75 percent of all LAU's were reported to have waste application rate limits, although this was true for only about 13 percent of the oil or gas waste LAU's. Approximately 60 percent of all LAU's were reported to have restrictions on the growing of food chain crops, while this was true for only about 43 percent of the industrial LAU's and about 3 percent of the oil or gas waste LAU's. Slightly more than 50 percent of all LAU's were reported to have run-on/run-off controls, although about 78 percent of the oil or gas waste LAU's and about 69 percent of the industrial waste LAU's had such controls. About 54 percent of all LAU's had waste restrictions or a ban on certain Subtitle D waste types, with about 65 percent of the industrial LAU's and only about 17 percent of the oil or gas waste LAU's having such restrictions.

Table 6.5. Number of Subtitle D land application units having design and operational controls

Management method	Number and percent of active individual Subtitle D land application units having release prevention methods						
	Municipal sewage sludge at high application rate	Municipal sewage sludge at low application rate	Total municipal sewage sludge*	Industrial waste	Oil or gas waste	Other	TOTAL
Run-on/run-off controls	59 (24.4%)	4,090 (41.8%)	5,075 (42.5%	3,837 (68.5%)	569 (78.4%)	164 (26.4%)	9,645 (51.1%)
Waste restrictions (ban on certain Subtitle D waste types)	185 (76.4%)	5,698 (58.3%)	5,932 (49.7%)	3,633 (64.8%)	122 (16.8%)	554 (89.2%)	10,241 (54.2%)
Waste application rate limits	195 (80.6%)	8,164 (83.5%)	9,437 (79.1%)	4,085 (72.9%)	93 (12.8%)	475 (76.5%)	14,090 (74.6%)
Restrictions on the growing of food chain crops	198 (81.8%)	7,672 (78.5%)	8,401 (70.4%)	2,395 (42.7%)	23 (3.2%)	576 (92.8%)	11,395 (60.3%)

*High rate application and low rate application may not equal the total municipal sewage sludge figures because some states do not distinguish between high and low application rate land application units.

7. SURFACE IMPOUNDMENTS

The following estimates are provided in this section:

- An estimate of the total number of Subtitle D surface impoundments in the United States;
- Estimates of the total number of Subtitle D surface impoundments by type;
- Estimates of the total numbers of Subtitle D surface impoundments by State and EPA region; and
- Distributions of the total number of Subtitle D surface impoundments by ownership, acreage, amount of waste, monitoring systems, and design and operational controls.

The reader is advised to review the definitions of facility types provided below as well as Section 7.1, "Assessment of Data Quality" when attempting to interpret the estimates provided in this section. Although not Subtitle D facilities, questions on municipal wastewater surface impoundments were included in this study to avoid sending a separate study concerning these facilities. The total number of municipal wastewater surface impoundments, which are regulated under the Clean Water Act, is presented in Section 7.2, but are not included elsewhere.

Definitions:

SURFACE IMPOUNDMENT - A part of an establishment which is a natural topographic depression, man-made excavation, or diked area formed primarily of earthen materials (although it may be lined with man-made materials) that is designed to hold an accumulation of liquid wastes or wastes containing free liquids. Treatment, storage, and disposal surface impoundments are included. Surface impoundments are often referred to as pits, ponds, or lagoons. This definition does not include any type of tank, including concrete, fiberglass or steel tanks.

MUNICIPAL WASTEWATER SURFACE IMPOUNDMENT - A publicly owned surface impoundment, commonly known as a sewage lagoon or sewage pond, designed to provide partial or total treatment for domestic sewage or a mixture of domestic and industrial wastewater.

MUNICIPAL SEWAGE SLUDGE SURFACE IMPOUNDMENT - A surface impoundment that receives sewage sludge from publicly-owned or privately-owned domestic sewage treatment establishments, including septic tanks.

MUNICIPAL RUN-OFF SURFACE IMPOUNDMENT - A surface impoundment that is used for the collection of run-off or leachate from municipal waste landfills or municipal waste land application units.

INDUSTRIAL WASTE SURFACE IMPOUNDMENT - A surface impoundment that primarily receives wastes from factories, processing plants (including food processing), and other manufacturing or commercial activities. Also included in this category are surface impoundments used for the collection of run-off or leachate from industrial or demolition landfills and industrial land application units.

AGRICULTURAL WASTE SURFACE IMPOUNDMENT - A surface impoundment that only receives waste from agricultural operations, including farming, crop production, and animal husbandry (including feedlots). Specifically excluded from this category are surface impoundments that are used for wastes from slaughter houses, other animal processing, and food processing, which are included in the "industrial" category.

MINING WASTE SURFACE IMPOUNDMENT - A surface impoundment associated with mineral extraction and beneficiation activities such as crushing, screening, washing, floatation, etc. These minerals include metallic and non-metallic ores, coal, sand and gravel, but exclude oil and gas. Specifically excluded are impoundments used for processing wastes from manufacturing establishments which are included in the "industrial" category.

OIL OR GAS WASTE SURFACE IMPOUNDMENT - A surface impoundment that receives waste from oil or gas exploration and extraction, commonly known as brine pits. Both disposal and emergency brine pits are included. Specifically excluded are impoundments used for petroleum refinery wastes, which are included in the "industrial" category.

OTHER SURFACE IMPOUNDMENT - A surface impoundment receiving Subtitle D wastes that does not fall into any of the above categories (e.g., a drinking water treatment waste impoundment).

7.1 Assessment of Data Quality

The estimated numbers of active Subtitle D surface impoundments in 1984 that are presented below do not include estimated totals for a large number of States/Territories. Nine States and Territories did not provide any estimates of numbers of surface impoundments (CA, KY, MN, MO, UT, VT, WY, Puerto Rico, and Virgin Islands). One State (SD) provided an estimate of the total number, but could not break down the estimate into categories. The number of surface impoundments may be an underestimate for an additional reason. Some States did not include facilities that did not require permits. Texas, among other States, did not include temporary surface impoundments located next to drilling rigs receiving oil or gas waste. In addition, the States listed below could not provide estimates of impoundments in the categories given:

- municipal sewage sludge - IL, LA, RI;
- municipal run-off - IL, LA, RI;
- industrial waste - LA;
- agricultural waste - LA, NY;
- mining waste - NY; and
- oil or gas waste - IN, MT, NY, and RI.

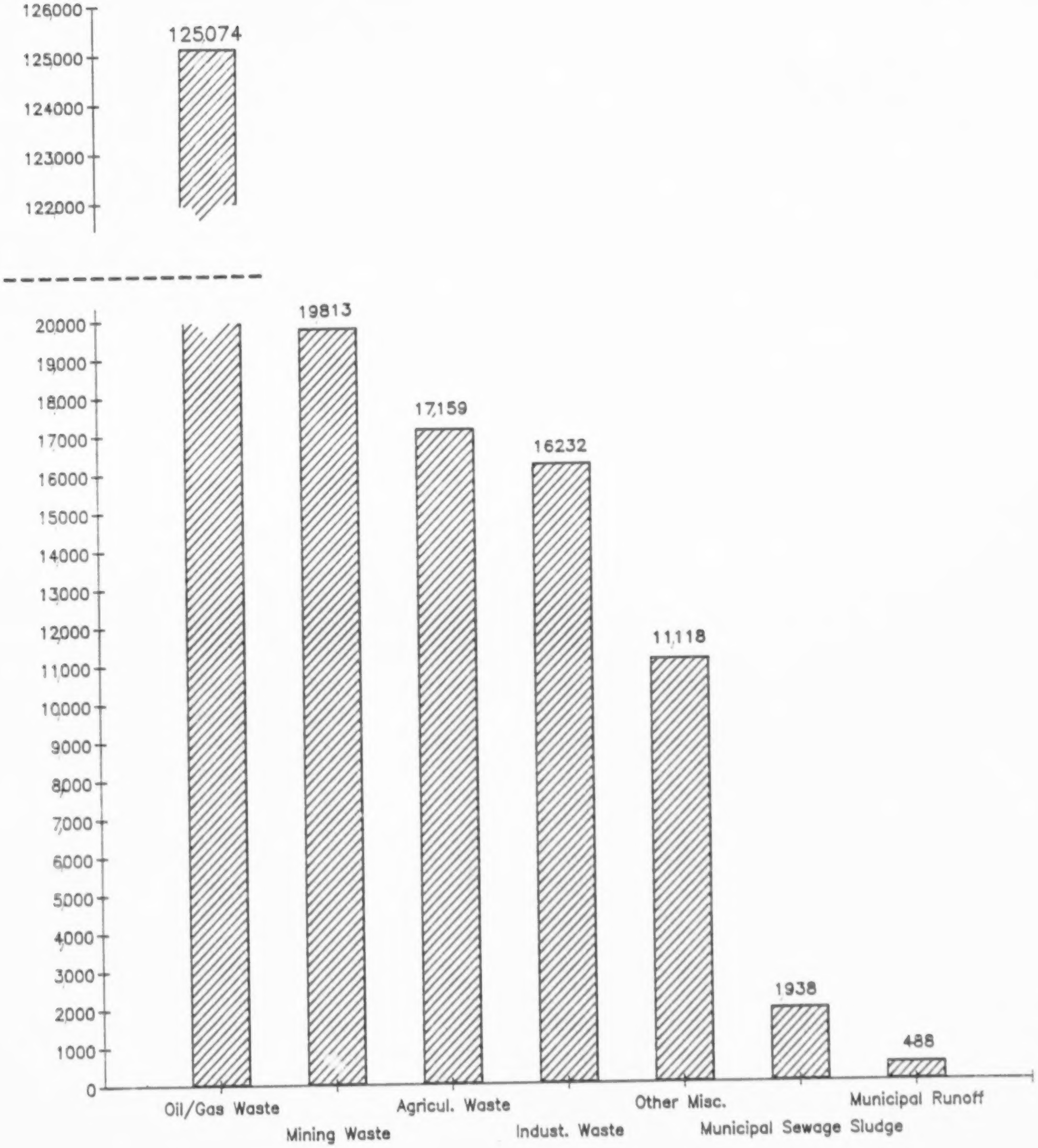
7.2 Estimated Number of Active Subtitle D Surface Impoundments in 1984

The total estimated number of active Subtitle D surface impoundments in 1984 produced as a result of this study is 191,822 (46 States/Territories reporting). A breakdown of the total number of surface impoundments by type is presented in Figure 7.1. The number of establishments that had at least one surface impoundment is 108,383 (40 States/Territories reporting).

An estimated 125,074 active oil or gas waste surface impoundments in 1984 were reported. Oil or gas waste surface impoundments accounted for 59.0 percent of the total number of impoundments reported. The next largest category which had a significantly smaller number of impoundments than oil or gas waste was mining waste, with 19,813 impoundments. Agricultural waste (17,159), industrial waste (16,232) and other miscellaneous impoundments (11,118) were also reported in relatively large numbers. Less than 2,000 municipal sewage sludge impoundments and less than 500 municipal run-off impoundments were reported. The "other" category of surface impoundments includes 5,366 miscellaneous impoundments, 4,600 single family lagoons, 692 water treatment sludge impoundments, 50 stormwater run-off impoundments, and 20 fish hatcheries.

An estimated 20,199 municipal wastewater surface impoundments were reported. In general, the characteristics of these facilities differed somewhat from those of the Subtitle D facilities described in this report and will be presented in a separate report.

Figure 7.1
NUMBER OF SUBTITLE D SURFACE IMPOUNDMENTS BY TYPE
Total Estimated Number of Subtitle D Surface Impoundments = 191,822*



7.3 Estimated Number of Surface Impoundments by State and EPA Region

The total estimated number of active Subtitle D surface impoundments in 1984 for each State and Territory is shown on the map presented in Figure 7.2. Pennsylvania (32,653) reported the largest number of surface impoundments, followed by Arkansas (25,705), Louisiana (20,010), West Virginia (18,705), and New Mexico (17,044).

Figure 7.3 presents the five States that account for the largest percentage of the total number of surface impoundments of a given impoundment type. Pennsylvania (5,600, West Virginia (5,000), Alabama (2,500), Tennessee (1,317), and New Mexico (858) account for 77 percent of all mining waste surface impoundments. Wisconsin (3,090, Kansas (1,729), Alabama (1,200), Nebraska (1,157), and Mississippi (1,050) account for 48 percent of all agricultural waste impoundments. Ohio (1,697) and Pennsylvania (1,645) account for 21 percent of all industrial waste impoundments.

Arizona (25,000), Louisiana (20,000), Pennslyvania (19,702), New Mexico (15,761), and West Virginia (13,000) account for 75 percent of all oil or gas waste surface impoundments. Estimates of total numbers of oil or gas waste impoundments are provided for each State/Territory on the map in Figure 7.4. As shown on this map there is great variation between States in terms of estimated numbers of oil or gas waste impoundments. Twenty-one States and Territories reported having no oil or gas waste impoundments, while twelve States reported having over 1,000 oil or gas waste impoundments.

The total estimated number of Subtitle D surface impoundments by EPA Region is presented in Figure 7.5. EPA

Figure 7.2

NUMBER OF SUBTITLE D SURFACE IMPOUNDMENTS BY STATE/TERRITORY

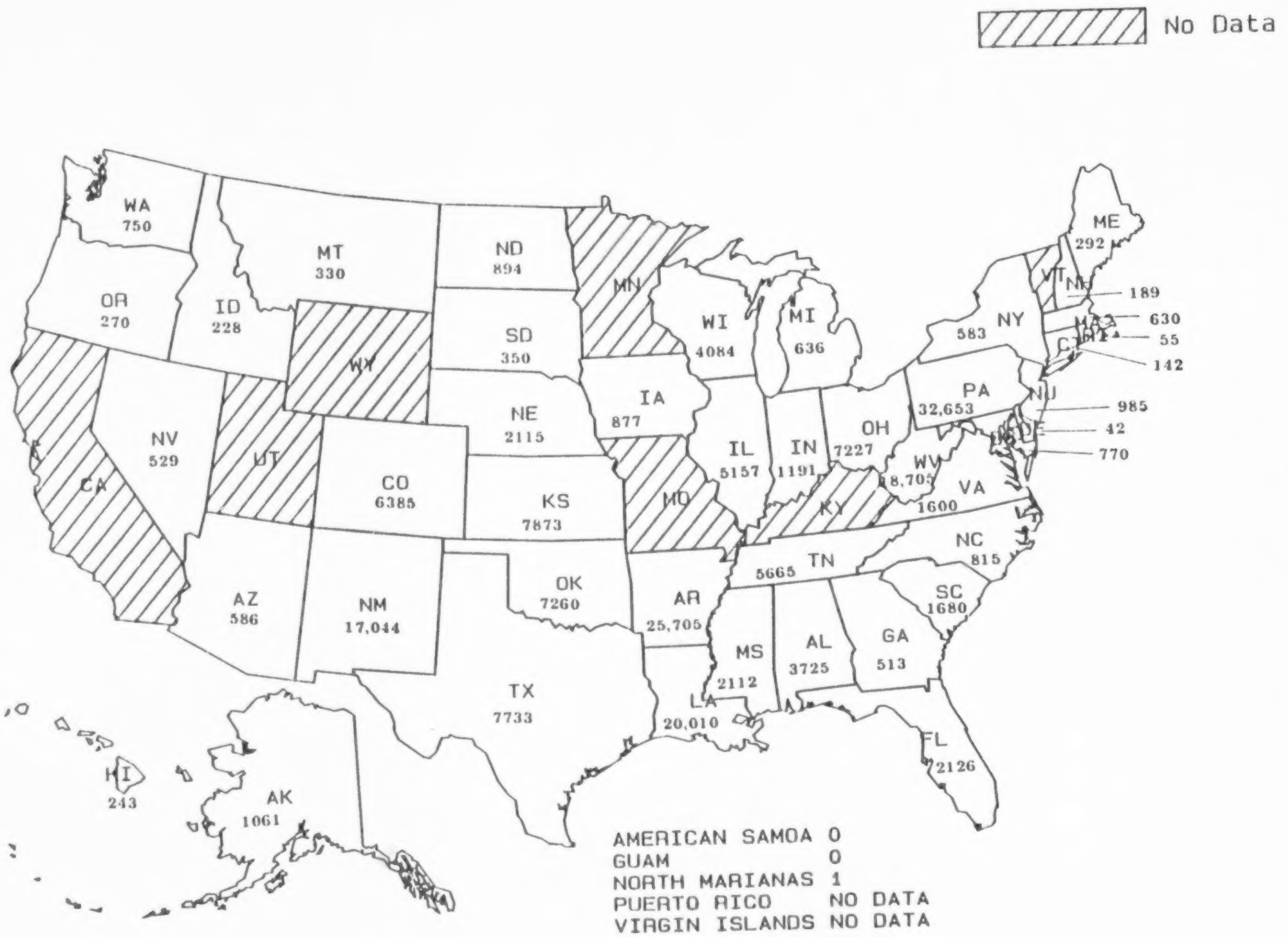


Figure 7.3
PERCENTAGE ACCOUNTED FOR BY THE FIVE STATES WITH THE LARGEST NUMBER OF SURFACE IMPOUNDMENTS BY TYPE

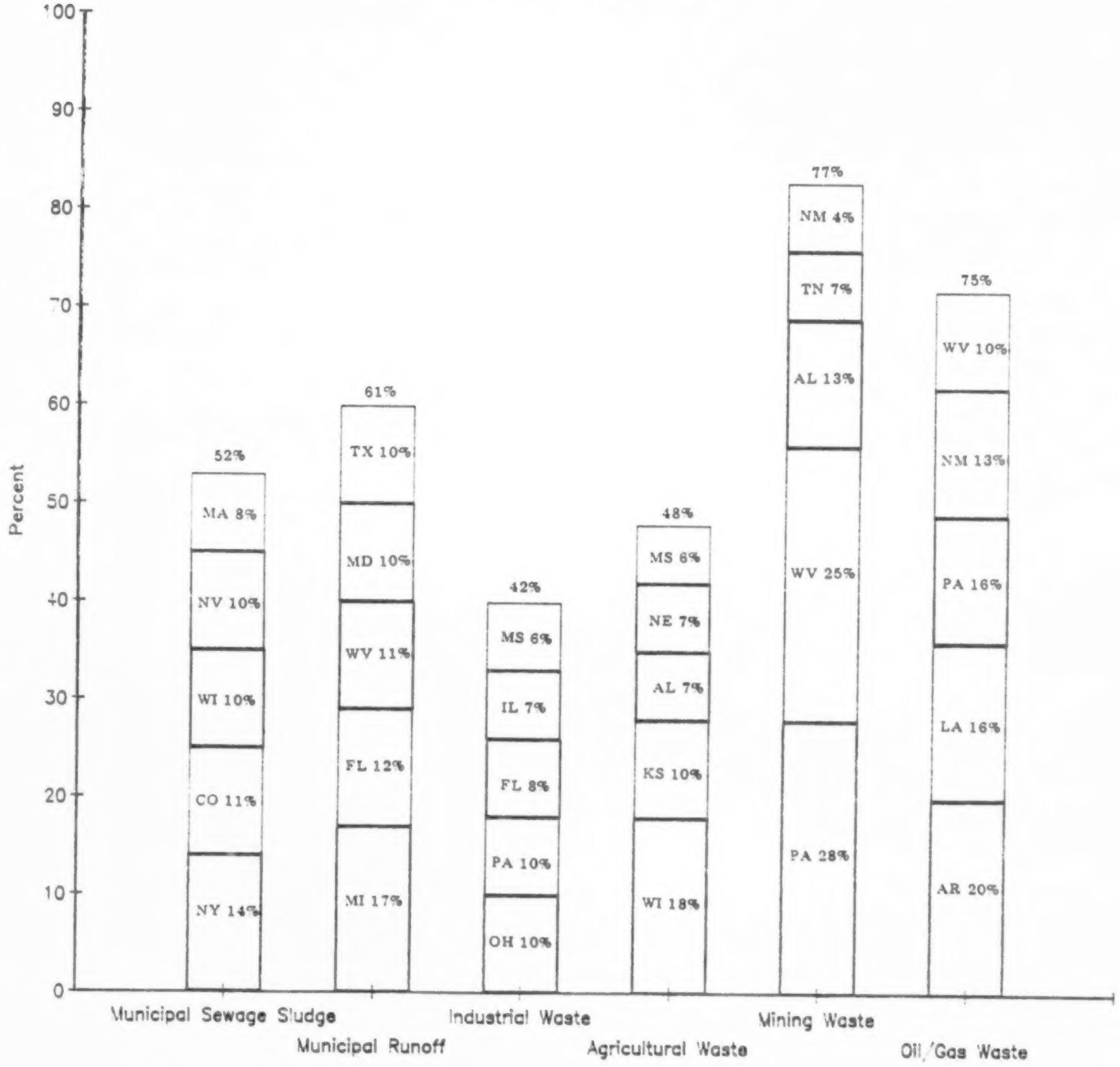


Figure 7.4

NUMBER OF SUBTITLE D OIL AND GAS WASTE SURFACE IMPOUNDMENTS BY STATE/TERRITORY

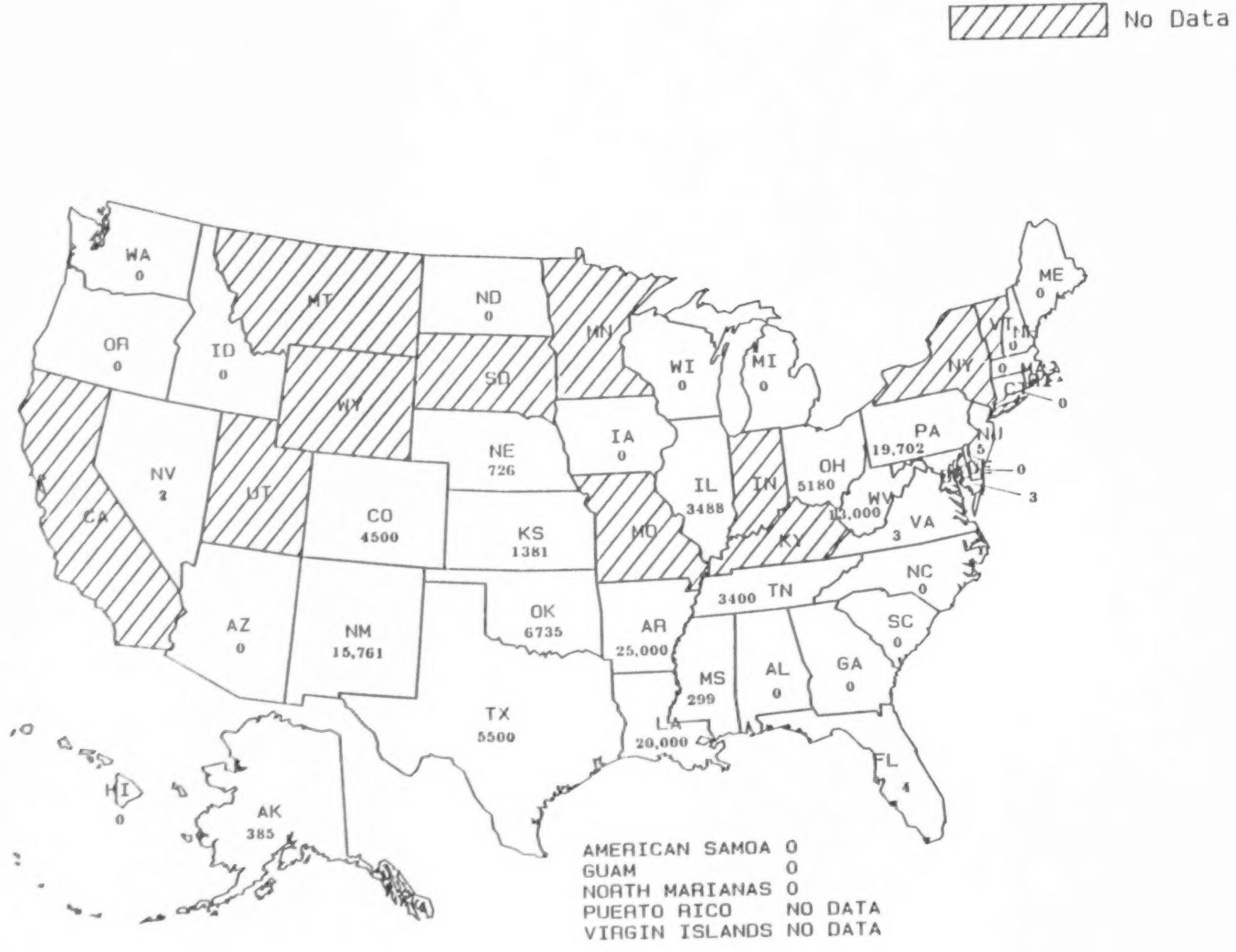
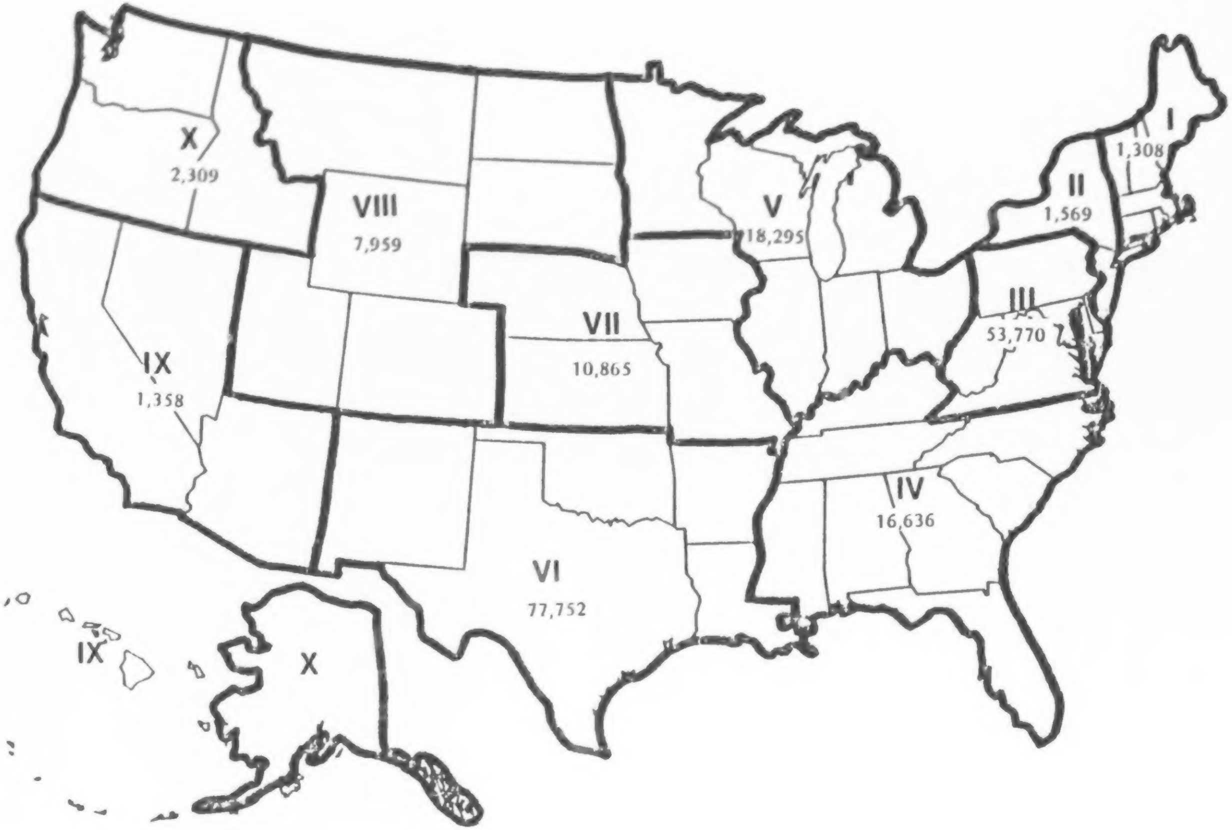


Figure 7.5
NUMBER OF SUBTITLE D SURFACE IMPOUNDMENTS BY EPA REGION



Region VI (77,752) contains the largest number of surface impoundments, followed by Region III, Region IV, and Region V, in that order.

7.4 Basic Characteristics of Subtitle D Surface Impoundments

7.4.1 Ownership

Ownership was reported for 149,711 (78%) of the 191,822 surface impoundments as shown in Table 7.1. The vast majority (98.2%) of surface impoundments are privately owned, although local governments own, as might be expected, the majority of municipal sewage sludge and municipal run-off surface impoundments.

7.4.2 Acreage

Acreage was reported for 123,412 (64%) of the 191,822 surface impoundments as shown in Table 7.2. In total, 90 percent of the surface impoundments were reported to be less than one acre. Ninety-eight percent of the oil or gas waste impoundments were reported to be less than one acre, while over 30 percent of mining impoundments were reported to be six acres or larger.

7.4.3 Amount of Waste

Amount of waste was reported for 124,038 (65%) of the 191,822 surface impoundments, as shown in Table 7.3. In total, approximately 82 percent of the surface impoundments were

Table 7.1. Number of Subtitle D surface impoundments by ownership category

Surface impoundment type	Response rate	Number and percent of active individual Subtitle D surface impoundments				
		Owned by State government	Owned by local governments	Owned by Federal government	Privately owned	TOTAL
Municipal sewage sludge	95%	19 (1.0%)	1,327 (72.4%)	42 (2.3%)	446 (24.3%)	1,834 (100%)
Municipal run-off	100%	0	368 (75.4%)	5 (1.0%)	115 (23.6%)	448 (100%)
Industrial waste	66%	94 (0.9%)	71 (0.7%)	74 (0.7%)	10,519 (97.8%)	10,758 (100%)
Agricultural waste	92%	25 (0.2%)	0	3 (0.02%)	15,733 (99.8%)	15,761 (100%)
Mining waste	69%	0	5 (0.04%)	0	13,625 (99.96%)	13,630 (100%)
Oil or gas waste	69%	0	0	0	101,884 (100%)	101,884 (100%)
Other	48%	20 (0.4%)	663 (12.4%)	11 (0.2%)	4,662 (87.0%)	5,356 (100%)
TOTAL	78%	158 (0.1%)	2,434 (1.6%)	135 (0.1%)	146,984 (98.2%)	149,711 (100%)

Table 7.2. Number of Subtitle D surface impoundments by acreage category

Surface impoundment type	Response rate	Number and percent of active individual Subtitle D surface impoundments with:							
		<0.1 acre	0.1-0.4 acres	0.5-0.9 acres	1-5 acres	6-10 acres	11-100 acres	>100 acres	TOTAL
Municipal sewage sludge	68%	138 (11.1%)	524 (42.0%)	405 (32.5%)	155 (12.4%)	16 (1.3%)	4 (0.3%)	5 (0.4%)	1,247 (100%)
Municipal run-off	71%	43 (12.4%)	123 (35.5%)	92 (26.6%)	67 (19.4%)	16 (4.6%)	5 (1.4%)	0	346 (100%)
Industrial waste	40%	705 (10.8%)	1,627 (24.8%)	2,205 (33.6%)	1,113 (17.0%)	458 (7.0%)	380 (5.8%)	70 (1.1%)	6,558 (100%)
Agricultural waste	69%	560 (4.7%)	5,843 (49.5%)	2,445 (20.7%)	2,791 (23.6%)	68 (0.6%)	102 (0.9%)	0	11,809 (100%)
Mining waste	33%	320 (5.0%)	439 (6.9%)	927 (14.4%)	2,679 (41.6%)	1,801 (28.0%)	257 (4.0%)	17 (0.3%)	6,440 (100%)
Oil or gas waste	73%	36,575 (39.9%)	48,318 (42.7%)	5,316 (5.8%)	1,244 (1.4%)	237 (0.3%)	27 (0.03%)	25 (0.03%)	91,742 (100%)
Other	47%	4,833 (91.7%)	241 (4.6%)	137 (2.6%)	42 (0.8%)	15 (0.3%)	2 (0.04%)	0	5,270 (100%)
TOTAL	64%	43,174 (35.0%)	57,115 (46.3%)	11,527 (9.3%)	8,091 (6.6%)	2,611 (2.1%)	777 (0.6%)	117 (0.1%)	123,412 (100%)

Table 7.3. Number of Subtitle D surface impoundments by amount of waste

Surface impoundment type	Response rate	Number and percent of active individual Subtitle D surface impoundments by amount of waste received per day (in 1,000's of gallons):						
		<50 gal/day	50-99 gal/day	100-499 gal/day	500-999 gal/day	1,000-9,999 gal/day	>10,000 gal/day	TOTAL
Municipal sewage sludge	79%	1,392 (95.7%)	50 (3.4%)	14 (1.0%)	2 (0.2%)	0	0	1,455 (100%)
Municipal run-off	58%	215 (75.7%)	58 (20.4%)	0	3 (1.1%)	8 (2.8%)	0	284 (100%)
Industrial waste	40%	2,998 (46.1%)	1,202 (18.5%)	935 (14.4%)	817 (12.6%)	470 (7.2%)	85 (1.3%)	6,507 (100%)
Agricultural waste	70%	11,074 (92.9%)	831 (7.0%)	21 (0.2%)	0	0	0	11,926 (100%)
Mining waste	31%	2,372 (39.2%)	619 (10.2%)	1,136 (18.8%)	630 (10.4%)	946 (15.6%)	350 (5.8%)	6,053 (100%)
Oil or gas waste	74%	79,096 (85.3%)	266 (0.3%)	13,316 (14.4%)	0	0	0	92,678 (100%)
Other	46%	5,013 (97.8%)	71 (1.4%)	36 (0.7%)	5 (0.1%)	7 (0.1%)	0	5,125 (100%)
TOTAL	65%	102,160 (82.4%)	3,097 (2.5%)	15,458 (12.5%)	1,457 (1.2%)	1,431 (1.2%)	435 (0.4%)	124,038 (100%)

Note: Percentages may not sum to 100 percent due to rounding.

reported to receive less than 50,000 gallons per day, while 13 percent were reported to receive between 100,000 and 499,999 gallons per day. A total of 435 surface impoundments (Oil/gas - 350 and Industrial - 85) were reported to receive 10,000,000 or more gallons per day.

7.4.4 Surface Impoundment Monitoring Systems

The number of Subtitle D surface impoundments that had groundwater, surface water, and air emissions monitoring systems in 1984 are presented in Table 7.4. The percentages given in this table represent the total number of surface impoundments having a monitoring system divided by the total number of surface impoundments reported above (e.g., 1,396 industrial waste surface impoundments were reported to have groundwater monitoring systems out of a total of 16,232 industrial waste surface impoundments. Thus, 8.6 percent of the industrial waste surface impoundments are estimated to have groundwater monitoring systems).

Approximately 17 percent of all Subtitle D surface impoundments had surface water monitoring systems, about 4 percent had groundwater monitoring systems, and less than 1 percent had air emissions monitoring systems.

7.4.5 Surface Impoundment Design and Operational Controls

The numbers of Subtitle D surface impoundments that had various design and operational controls are presented in Table 7.5. Only 2.1 percent of all surface impoundments had synthetic liners; about 27 percent had natural liners. Leak detection systems were reported for about 1 percent of all surface impoundments; discharge permits were reported for 31 percent; overtopping controls for about 25 percent; and waste restrictions for about 27 percent.

Table 7.4. Number of Subtitle D surface impoundments having monitoring systems

Surface impoundment type	Groundwater monitoring	Surface water monitoring	Air emissions monitoring
Muncipal sewage sludge	131 (6.8%)	50 (2.6%)	10 (0.5%)
Municipal run-off	192 (39.3%)	57 (11.7%)	0
Industrial waste	1,396 (8.6%)	3,151 (19.4%)	73 (0.4%)
Agricultural waste	44 (0.3%)	135 (0.8%)	1 (<0.1%)
Mining waste	5,399 (27.2%)	8,679 (43.8%)	15 (0.1%)
Oil or gas waste	165 (0.1%)	20,030 (16.0%)	25 (<0.1%)
Other	7 (0.1%)	133 (1.2%)	0
TOTAL	7,334 (3.8%)	32,235 (16.8%)	124 (0.1%)

Table 7.5. Number of Subtitle D surface impoundments having design and operational controls

Management method	Municipal sewage sludge	Municipal run-off	Industrial waste	Agricultural waste	Mining waste	Oil or gas waste	Other	TOTAL
Synthetic liners	76 (3.9%)	23 (4.7%)	756 (4.7%)	60 (0.3%)	200 (1.0%)	2,950 (2.4%)	6 (0.1%)	4,071 (2.1%)
Natural liners (e.g., clay)	508 (26.2%)	140 (28.7%)	2,818 (17.4%)	9,299 (54.2%)	868 (4.4%)	33,768 (27.0%)	4,835 (43.5%)	52,236 (27.2%)
Leak detection systems	32 (1.7%)	37 (7.6%)	896 (5.5%)	26 (0.2%)	335 (1.7%)	1,406 (1.1%)	0	2,732 (1.4%)
Overtopping controls	589 (30.4%)	269 (55.1%)	3,672 (22.6%)	6,713 (39.1%)	4,144 (20.9%)	28,541 (22.8%)	4,733 (42.6%)	48,661 (25.4%)
Waste restrictions (ban on certain Subtitle D waste types)	634 (32.7%)	71 (14.5%)	2,685 (16.5%)	8,371 (48.8%)	4,358 (22.0%)	30,509 (24.4%)	4,736 (42.6%)	51,364 (26.8%)
Discharge permit	522 (26.9%)	16 (3.3%)	4,738 (29.2%)	2,018 (11.8%)	4,970 (25.1%)	46,491 (37.2%)	171 (1.5%)	58,926 (30.7%)

PART IV

STATE SUBTITLE D REGULATORY PROGRAMS

Section 8. Landfills
Section 9. Land Application Units
Section 10. Surface Impoundments

PART IV

STATE SUBTITLE D REGULATORY PROGRAMS

Part IV provides data on State/Territorial regulatory programs for Subtitle D landfills, land application units, and surface impoundments in Sections 8, 9, and 10, respectively. A parallel structure has been used to present data in each of these sections. Each section begins with data regarding regulations for Subtitle D requirements. Licensing/permitting requirements and enforcement programs are then described in that order within each section.

To properly interpret estimates provided in Sections 8, 9, and 10, the reader is advised to review Part I, Section 2, "Survey Methodology", Part I, Section 3, "Statistical Reliability", and the definitions of facility types presented in the introductions to Sections 5, 6, and 7.

In addition to the above, each State and Territory was also asked to submit copies of its regulations to EPA. An EPA contractor (PEI) was then asked to review and submit a separate report on these regulations.

8. LANDFILLS

The following estimates are provided in this section:

- number of States/Territories that have regulations pertaining to specific Subtitle D landfill requirements;
- number of States/Territories that have landfill permitting and licensing requirements;
- number of individual Subtitle D landfills that have permits and licenses;
- frequency of inspection of Subtitle D landfills;
- number of inspections of Subtitle D landfills in 1984;and
- number of violations of Subtitle D landfills in 1984.

8.1 Subtitle D Landfill Regulations

As part of this study all States and Territories were asked to review a list of Subtitle D requirements and indicate whether or not each of these requirements was: specifically included in State/Territory regulations; enforced under general standards and policies; or not enforceable under any State/Territory regulations, standards, or policies. Data from all responding States and Territories are reported in Table 8.1.

Most requirements were more likely to be enforced under general standards and policies rather than specifically included in current Subtitle D programs.

Table 8.1

SUBTITLE D LANDFILL REGULATIONS

	Number of states with requirements included in current State Subtitle D program					
	Municipal waste			Industrial waste		
	Specifically included in the regulations	Enforced under general standards and policies	No enforceable requirements	Specifically included in the regulations	Enforced under general standards and policies	No enforceable requirements
a. Natural (e.g., clay) liners	14	29	11	12	27	10
b. Synthetic liners	10	23	19	8	24	17
c. Location standards (e.g., floodplains)	37	12	3	34	13	3
d. Leachate collection and removal	19	22	11	15	24	11
e. Leachate characterization/ analysis	9	30	13	8	29	13
f. Leachate treatment	15	22	15	14	23	13
g. Groundwater protection standard	30	16	6	27	18	5
h. Groundwater monitoring	37	12	3	32	14	3
i. Corrective action for groundwater contamination	21	22	9	17	25	8
j. Air protection standard	25	18	9	22	21	7
k. Air emissions monitoring	4	26	21	5	24	21
l. Methane monitoring	15	3	14	14	20	16
m. Methane controls	27	15	10	22	15	13
n. Corrective action for off-site methane migration	17	18	17	14	19	17
o. Surface water protection standards	35	15	2	33	15	2
p. Surface water monitoring	15	31	6	14	30	6
q. Corrective action for surface water contamination	18	27	7	15	28	7
r. Run-off collection and removal	20	25	7	19	23	8
s. Run-off characterization/ analysis	8	28	16	7	28	15
t. Run-off treatment	6	27	19	6	26	18
u. Run-on controls	26	19	7	25	19	6
v. Restrictions on receipt of liquid waste	25	18	9	22	20	8
w. Restrictions on types of Subtitle D wastes received	33	13	6	31	12	7
x. Daily cover	50	2	0	41	8	1
y. Endangered species criteria	25	13	14	23	15	13
z. Disease vectors criteria	39	10	3	34	10	5
aa. Safety criteria: Bird hazards	31	13	8	26	16	8
bb. Safety criteria: Uncontrolled access	41	8	3	40	9	4
cc. Closure standards (e.g., caps)	39	13	0	37	11	2
dd. Postclosure monitoring	29	13	10	28	14	8
ee. Financial responsibility	20	11	20	19	10	21

(continued)

Table 8.1 (Cont.)

SUBTITLE D LANDFILL REGULATIONS

	Number of requirements included in current State Subtitle D program					
	Demolition debris only			Other		
	Specifically included in the regulations	Enforced under general standards and policies	No enforceable requirements	Specifically included in the regulations	Enforced under general standards and policies	No enforceable requirements
a. Natural (e.g., clay) liners	5	25	19	5	10	6
b. Synthetic liners	3	20	26	3	6	12
c. Location standards (e.g., floodplains)	28	15	7	13	4	4
d. Leachate collection and removal	10	18	21	6	8	7
e. Leachate characterization/ analysis	4	23	21	4	8	9
f. Leachate treatment	7	22	20	7	6	8
g. Groundwater protection standard	23	14	12	12	5	4
h. Groundwater monitoring	21	18	10	13	5	3
i. Corrective action for groundwater contamination	14	21	14	6	8	7
j. Air protection standard	22	18	10	7	7	7
k. Air emissions monitoring	4	22	23	1	7	13
l. Methane monitoring	11	17	21	7	6	8
m. Methane controls	16	15	19	11	4	6
n. Corrective action for off-site methane migration	11	16	23	7	4	10
o. Surface water protection standards	26	17	6	14	5	2
p. Surface water monitoring	10	28	11	5	13	3
q. Corrective action for surface water contamination	13	27	10	6	10	5
r. Run-off collection and removal	14	24	12	8	8	5
s. Run-off characterization/ analysis	4	26	20	5	8	8
t. Run-off treatment	3	24	23	3	10	8
u. Run-on controls	18	21	10	12	4	5
v. Restrictions on receipt of liquid waste	21	22	6	9	9	3
w. Restrictions on types of Subtitle D wastes received	27	18	5	13	4	4
x. Daily cover	30	13	6	12	7	2
y. Endangered species criteria	19	13	17	10	4	7
z. Disease vectors criteria	33	8	8	16	3	2
aa. Safety criteria: Bird hazards	24	15	11	13	3	5
bb. Safety criteria: Uncontrolled access	32	10	8	15	4	2
cc. Closure standards (e.g., caps)	30	15	5	15	5	1
dd. Postclosure monitoring	20	14	15	13	4	4
ee. Financial responsibility	14	11	24	9	5	7

Those requirements most often included specifically in State/Territory regulations, in descending order were:

- Daily cover;
- Safety: uncontrolled access
- Closure standards;
- Disease vectors criteria;
- Groundwater monitoring; and
- Surface water protection standards.

These requirements were the most frequently named as being specifically included in State/Territory regulations for all four landfill types.

Those requirements for which States/Territories were the least likely to have any regulations were:

- Air emissions;
- Financial responsibility;
- Run-off treatment;
- Synthetic liners;
- Corrective action for off-site methane migration; and
- Run-off characterization/analysis.

Once again, this was true, in general, for all four landfill types.

8.2 Landfill Permitting/Licensing Requirements

The number of States/Territories requiring landfill permits/plan approval and landfill licenses/registrations are provided in Table 8.2. For municipal waste landfills, New Mexico does not require a permit or approved plan, but does, however, require each municipal waste landfill to obtain a license to operate. Three States do not require permits for industrial waste landfills: New Mexico (which requires neither permitting nor licensing for industrial waste landfills), Hawaii (where no industrial landfills exist), and Montana (where "on-site industrial and commercial waste disposal is excluded from permit requirements under most conditions"). Five States and the Virgin Islands do not require permits for demolition debris landfills. The five States are Florida, New Mexico, Ohio, Nebraska, and Utah.

The number of Subtitle D landfills that have permits and licenses are presented in Table 8.3. The number of permitted landfills provided in this table are significantly smaller than the total number of Subtitle D landfills reported in Section 5. This is due to the fact that some States/Territories require permits for some, but not all types of landfills within a specific category. As examples, in the State of Florida on-site disposal of on-site generated industrial waste is exempt from permit requirements, and in the State of Nebraska no license, plan, or approval is needed for landfill sites operated by or under contract to municipalities of less than 5,000 population.

8.3 State Enforcement Programs for Subtitle D Landfills

The frequency with which Subtitle D landfills are inspected by States/Territories is presented in Table 8.4. About

Table 8.2. Subtitle D permitting/licensing requirements: Landfills

Landfill type	Number of states with: Permit or plan approval required		License or registration required	
	Yes	No	Yes	No
Municipal waste	53	1	11	42
Industrial waste	50	3	8	44
Demolition debris only	47	6	8	44
Other	16	4	3	16

Table 8.3. Number of Subtitle D landfills with permits and licenses

Landfill type	Have permits or approved plans	Are licenced or registered
Municipal waste	5,444	2,206
Industrial waste	1,392	319
Demolition debris only	1,377	150
Other	209	11
TOTAL	8,422	2,686

Table 8.4. Frequency of inspection of Subtitle D landfills

	Municipal waste	Industrial waste	Demolition debris	Other	TOTAL
Response Rate	90%	94%	92%	98%	91%
Never inspected	431 (5.1%)	157 (4.8%)	212 (9.2%)	64 (6.4%)	864 (5.8%)
Less than once every two years	347 (4.1%)	376 (11.4%)	202 (8.8%)	10 (1.0%)	935 (6.2%)
Once every two years	776 (9.3%)	87 (2.6%)	308 (13.4%)	301 (30.0%)	1,472 (9.8%)
Once a year	2,609 (31.1%)	512 (15.3%)	580 (25.2%)	513 (51.0%)	4,214 (28.1%)
Twice a year	1,272 (15.2%)	482 (14.6%)	733 (31.9%)	100 (9.9%)	2,587 (17.3%)
Four times a year	1,548 (18.5%)	416 (12.6%)	142 (6.2%)	15 (1.5%)	2,121 (14.2%)
More than four times a year	1,279 (15.3%)	1,243 (37.7%)	93 (4.0%)	3 (0.2%)	2,618 (17.5%)
Other	122 (1.5%)	24 (0.7%)	30 (1.3%)	0	176 (1.2%)
TOTAL	8,384 (100%)	3,297 (100%)	2,300 (100%)	1,006 (100%)	14,987 (100%)

22 percent of all Subtitle D landfills are inspected once every two years or less and about 6 percent of all Subtitle D landfills are never inspected, according to study respondents. The total number of landfill inspections for compliance with Subtitle D regulations made during 1984 is provided in Table 8.5. Estimates in Table 8.5 represent the total number of inspections made, rather than the number of landfills inspected (e.g., ten inspections may have been made of the same landfill).

The total number and types of violations that were found in 1984 landfill inspections is presented in Table 8.6. These numbers are a reflection of the following:

- the number of inspections conducted by States/Territories in 1984;
- the types of violations for which the 1984 inspections were made; and
- the availability of monitoring systems at the landfills, as described in Section 5.4.4.

Table 8.5. Number of inspections of Subtitle D landfills in 1984

Landfill type	Number of inspections during 1984
Municipal waste	24,865
Industrial waste	4,354
Demolition debris only	2,834
Other	799
TOTAL	32,852

Table 8.6. Number of Subtitle D landfills by type of violation in 1984

Violation type	Number and percent of active individual Subtitle D landfills in violation in 1984:				TOTAL
	Municipal waste	Industrial waste	Demolition debris only	Other	
Groundwater contamination	586 (6.3%)	111 (3.2%)	16 (0.6%)	7 (0.7%)	720 (4.4%)
Groundwater monitoring program deficiencies	834 (9.0%)	117 (3.3%)	82 (3.2%)	108 (10.5%)	1,141 (7.0%)
Surface water contamination	660 (7.1%)	50 (1.4%)	42 (1.6%)	6 (0.6%)	758 (4.6%)
Air contamination	845 (9.1%)	18 (0.5%)	33 (1.3%)	54 (5.2%)	950 (5.8%)
Methane control deficiencies	180 (1.9%)	8 (0.2%)	0	1 (0.1%)	189 (1.2%)
Operational deficiencies (e.g., daily cover violation, or blowing litter) and other minor violations	4,784 (51.5%)	433 (12.3%)	531 (20.4%)	225 (21.8%)	5,973 (36.4%)
Other	222 (2.4%)	13 (0.4%)	7 (0.3%)	0	242 (1.5%)

9. LAND APPLICATION UNITS

The following estimates are provided in this section:

- number of States/Territories that have regulations pertaining to specific Subtitle D land application unit requirements;
- number of States/Territories that have land application unit permitting and licensing requirements;
- number of individual Subtitle D land application units that have permits and licenses;
- frequency of inspection of Subtitle D land application units;
- number of inspections of Subtitle D land application units in 1984;and
- number of violations of Subtitle D land application units in 1984.

9.1 Subtitle D Land Application Unit Regulations

As part of this study all States and Territories were asked to review a list of Subtitle D requirements and indicate whether each of these requirements was: specifically included in State/Territory regulations; enforced under general standards and policies; or not enforceable under any State/Territory regulations, standards, or policies. Data from all responding States and Territories are summarized in Table 9.1.

As with Subtitle D landfill regulations, the requirements for land application units were more likely to be enforced under general standards and policies than specifically included in current Subtitle D programs.

Table 9.1

SUBTITLE D LAND APPLICATION UNIT REGULATIONS

	Number of states with requirements included in current State Subtitle D program					
	Municipal sewage sludge at high application rate			Municipal sewage sludge at low application rate		
	Specifically included in the regulations	Enforced under general standards and policies	No enforceable requirements	Specifically included in the regulations	Enforced under general standards and policies	No enforceable requirements
a. Location standards (e.g., floodplains	14	24	2	23	24	2
b. Waste application limits	11	25	4	23	23	3
c. Restrictions on growing food chain crops	18	18	4	27	17	5
d. Restrictions on types of Subtitle D wastes received	14	23	3	21	25	3
e. Sludge quality criteria	12	25	3	22	24	3
f. Waste disinfection prior to application	12	20	8	20	22	7
g. Soil monitoring	9	26	5	16	29	4
h. Groundwater protection standard	20	17	2	26	20	2
i. Groundwater monitoring	13	24	3	15	27	7
j. Corrective action for groundwater contamination	4	29	7	8	34	7
k. Air emission monitoring	0	23	16	3	21	24
l. Air protection standards	7	20	12	8	21	19
m. Surface water protection standards	20	18	2	28	19	2
n. Surface water monitoring	9	26	5	12	30	7
o. Corrective action for surface water contamination	4	31	5	10	35	3
p. Run-off collection and removal	7	27	6	10	29	9
q. Run-off characterization/ analysis	5	28	7	8	30	11
r. Run-off treatment	5	27	8	7	33	9
s. Run-on controls	10	26	4	13	29	7
t. Endangered species criteria	6	16	18	5	21	22
u. Disease vectors criteria	12	17	8	15	22	12
v. Safety criteria: Uncontrolled access	17	21	2	21	24	4
w. Closure standards	8	24	8	10	27	12
x. Postclosure monitoring	7	23	10	9	25	15
y. Financial responsibility	7	14	19	8	15	26

(continued)

Table 9.1 (Cont.)

SUBTITLE D LAND APPLICATION UNIT REGULATIONS

	Number of states with requirements included in current State Subtitle D program					
	Industrial waste			Oil or gas waste		
	Specifically included in the regulations	Enforced under general standards and policies	No enforceable requirements	Specifically included in the regulations	Enforced under general standards and policies	No enforceable requirements
a. Location standards (e.g., floodplains)	16	27	4	5	22	6
b. Waste application limits	15	29	3	4	23	6
c. Restrictions on growing food chain crops	15	25	7	4	19	10
d. Restrictions on types of Subtitle D wastes received	15	26	6	4	23	6
e. Sludge quality criteria	12	31	4	3	23	7
f. Waste disinfection prior to application	11	27	9	3	20	11
g. Soil monitoring	13	30	4	3	23	8
h. Groundwater protection standard	22	22	3	13	17	4
i. Groundwater monitoring	14	28	5	5	23	6
j. Corrective action for groundwater contamination	6	35	6	4	24	6
k. Air emission monitoring	4	24	18	1	14	18
l. Air protection standards	10	21	15	3	13	17
m. Surface water protection standards	24	20	3	14	14	5
n. Surface water monitoring	11	32	4	4	24	5
o. Corrective action for surface water contamination	9	33	5	6	22	5
p. Run-off collection and removal	13	27	7	7	20	7
q. Run-off characterization/ analysis	6	31	10	3	23	8
r. Run-off treatment	5	34	8	5	22	7
s. Run-on controls	10	32	5	5	23	5
t. Endangered species criteria	5	20	22	2	10	22
u. Disease vectors criteria	13	19	14	3	13	17
v. Safety criteria: Uncontrolled access	18	23	6	6	15	11
w. Closure standards	10	27	10	3	20	10
x. Postclosure monitoring	9	27	11	2	18	13
y. Financial responsibility	7	20	20	3	15	15

(continued)

Table 9.1 (Cont.)

SUBTITLE D LAND APPLICATION UNIT REGULATIONS

	Number of states with requirements included in current State Subtitle D program		
	Other		
	Specifically included in the regulations	Enforced under general standards and policies	No enforceable requirements
a. Location standards (e.g., floodplains	2	6	0
b. Waste application limits	2	6	0
c. Restrictions on growing food chain crops	2	5	1
d. Restrictions on types of Subtitle D wastes received	2	6	0
e. Sludge quality criteria	1	7	0
f. Waste disinfection prior to application	2	6	0
g. Soil monitoring	2	5	1
h. Groundwater protection standard	2	6	0
i. Groundwater monitoring	1	7	0
j. Corrective action for groundwater contamination	0	8	0
k. Air emission monitoring	0	6	2
l. Air protection standards	1	5	2
m. Surface water protection standards	4	4	0
n. Surface water monitoring	1	7	0
o. Corrective action for surface water contamination	1	7	0
p. Run-off collection and removal	2	6	0
q. Run-off characterization/analysis	1	7	0
r. Run-off treatment	2	6	0
s. Run-on controls	1	7	0
t. Endangered species criteria	1	3	4
u. Disease vectors criteria	1	6	1
v. Safety criteria: Uncontrolled access	2	5	1
w. Closure standards	1	6	1
x. Postclosure monitoring	1	6	1
y. Financial responsibility	1	6	1

Those requirements most often included specifically in State/Territory regulations, in descending order were:

- Surface water protection;
- Ground water protection;
- Location standards;
- Waste application limits; and
- Restrictions on type of Subtitle D wastes received.

For low application rates municipal sewage sludge land application units, restrictions on the growing of food chain crops was also frequently included in specific State/Territory regulations.

In general, high application rate municipal sewage sludge and oil or gas land application units were much less likely to have any given requirement specifically included in regulations than were high application rate municipal sewage sludge and industrial land application units.

Those requirements for which States/Territories were the least likely to have any regulations were:

- Endangered species criteria;
- Financial responsibility;
- Air emissions;
- Air protection standards; and
- Post closure monitoring.

9.2 Land Application Unit Permitting/Licensing Requirements

The number of States and Territories that do and do not require permits/approved plans and licenses/registration for land application units is presented in Table 9.2. Responses with respect to the number of States and Territories that do not require permits is a reflection of the fact that these States and Territories (with the exception of Oregon and its oil or gas waste land application units) do not have any land application units that require permitting. The number of land application units having permits in those States which have permitting programs is provided in Table 9.3.

9.3 Enforcement Programs for Subtitle D Land Application Units

The frequency with which Subtitle D land application units are inspected by States/Territories is presented in Table 9.4. Seventy-two percent of all land application units are inspected once every two years or less according to the study returns. Approximately 24 percent of all industrial waste land application units are never inspected, while only about 3 percent of the municipal sewage sludge and 2 percent of the oil or gas waste land application units are never inspected. The majority of the oil or gas waste land application units (68.5%) are inspected at least twice a year.

The total number of land application unit inspections for compliance with Subtitle D requirements in 1984 is presented in Table 9.5. Estimates in this table represent the total number of inspections made, rather than the number of land application units inspected (e.g., multiple inspections may have been made of the same facility).

Table 9.2. Subtitle D permitting/licensing requirements: Land application units

	Number of states with:			
	Permit or plan approval required		License or registration required	
Land application unit type	Yes	No	Yes	No
Municipal sewage sludge at high application rate	36	14	6	44
Municipal sewage sludge at low application rate	44	6	5	45
Industrial waste	46	4	5	45
Oil or gas waste	32	14	4	43
Other	7	1	1	6

Table 9.3. Number of Subtitle D land application units with permits and licenses

Land application unit type	Have permits or approved plans	Are licenced or registered
Municipal sewage sludge at high application rate	242	1
Municipal sewage sludge at low application rate	6,893	296
Total municipal sewage sludge*	7,955	297
Industrial waste	3,331	113
Oil or gas waste	697	0
Other	519	0
TOTAL	12,502	410

*High rate application and low rate application may not equal the total municipal sewage sludge figures because some states do not distinguish between high and low rate land application units.

Table 9.4. Frequency of inspection of Subtitle D land application units

	Total municipal sewage sludge	Industrial waste	Oil and gas waste	Other	TOTAL
Response rate	95%	99%	100%	100%	97%
Never inspected	388 (3.4%)	1,308 (23.7%)	15 (2.1%)	71 (11.4%)	1,782 (9.8%)
Less than once every two years	6,489 (57.2%)	2,487 (45.0%)	6 (0.8%)	46 (7.4%)	9,028 (49.5%)
Once every two years	1,403 (12.4%)	845 (15.3%)	33 (4.5%)	28 (4.5%)	2,309 (12.7%)
Once a year	1,787 (15.8%)	639 (11.6%)	175 (24.1%)	26 (4.2%)	2,627 (14.4%)
Twice a year	254 (2.2%)	126 (2.3%)	465 (64.0%)	0	845 (4.6%)
Four times a year	98 (0.9%)	21 (0.4%)	4 (0.6%)	0	123 (0.7%)
More than four times a year	182 (1.6%)	10 (0.2%)	8 (1.1%)	0	200 (1.1%)
Other	743 (6.5%)	94 (1.7%)	20 (2.8%)	450 (72.5%)	1,307 (7.2%)
TOTAL	11,344 (100%)	5,530 (100%)	726 (100%)	621 (100%)	18,221 (100%)

Table 9.5. Number of inspections of Subtitle D land application units in 1984

Land application unit type	Number of inspections during 1984
Municipal sewage sludge at high application rate	174
Municipal sewage sludge at low application rate	4,089
Total municipal sewage sludge*	5,326
Industrial waste	1,601
Oil or gas waste	1,124
Other	34
TOTAL	8,085

*High rate application and low rate application may not equal the total municipal sewage sludge figures because some states do not distinguish between high and low rate land application units.

The total number and types of violations that were found in 1984 LAU inspections is presented in Table 9.6. These numbers are a reflection of the following:

- the number of inspections conducted by States/ Territories in 1984;
- the types of violations for which the 1984 inspections were made; and
- the availability of monitoring systems at the land application units, as described in Section 6.4.4.

Table 9.6. Number of Subtitle D land application units by type of violation in 1984

	Number and percent of active individual Subtitle D land application units in violation in 1984:						
Violation type	Municipal sewage sludge at high application rate	Municipal sewage sludge at low application rate	Total municipal sewage sludge*	Industrial waste	Oil or gas waste	Other	TOTAL
Groundwater contamination	4 (1.7%)	13 (0.1%)	17 (0.1%)	45 (0.8%)	2 (0.3%)	2 (0.3%)	66 (0.3%)
Groundwater monitoring program deficiencies	4 (1.7%)	6 (0.1%)	14 (0.1%)	41 (0.7%)	8 (1.1%)	1 (0.2%)	64 (0.3%)
Surface water contamination	1 (0.4%)	15 (0.2%)	17 (0.1%)	60 (1.1%)	25 (3.4%)	24 (3.9%)	126 (0.7%)
Air contamination	0	12 (0.1%)	12 (0.1%)	10 (0.2%)	0	0	22 (0.1%)
Operational deficiencies and other minor violations	6 (2.5%)	102 (1.0%)	115 (1.0%)	88 (1.6%)	82 (11.3%)	8 (1.3%)	293 (1.6%)
Other	0	10 (0.1%)	10 (0.1%)	0	0	0	10 (0.1%)

*High rate and low rate application may not equal the total municipal sewage sludge figures because some states do not distinguish between high and low rate application units.

10. SURFACE IMPOUNDMENTS

The following estimates are provided in this section:

- number of States/Territories that have regulations pertaining to specific Subtitle D surface impoundment regulations;
- number of States/Territories that have surface impoundment permitting and licensing requirements;
- number of individual Subtitle D surface impoundments that have permits and licenses;
- frequency of inspection of Subtitle D surface impoundments;
- number of inspections of Subtitle D surface impoundments in 1984;
- number of violations of Subtitle D surface impoundments in 1984; and
- number of Subtitle D surface impoundments having various monitoring and release prevention management methods.

10.1 Subtitle D Surface Impoundment Regulations

As part of this study all States and Territories were asked to review a list of Subtitle D requirements and indicate whether or not each of these requirements was: specifically included in State/Territory regulations; enforced under general standards and policies; or not enforceable under any State/Territory regulations, standards, or policies. Data from all responding States and Territories are reported in Table 10.1.

As with the other types of Subtitle D facility regulations, the requirements for surface impoundments were more

Table 10.1

SUBTITLE D SURFACE IMPOUNDMENT REGULATIONS

	Number of states with requirements included in current State Subtitle D program					
	Municipal sewage sludge			Municipal run-off		
	Specifically included in the regulations	Enforced under general standards and policies	No enforceable requirements	Specifically included in the regulations	Enforced under general standards and policies	No enforceable requirements
a. Location standards (e.g., floodplains)	17	22	3	11	19	9
b. Natural liners (e.g., clay)	9	29	3	6	21	11
c. Synthetic liners	7	29	5	6	19	13
d. Leak detection system	5	23	13	6	19	13
e. Groundwater protection standard	19	17	5	17	12	8
f. Groundwater monitoring	13	22	6	11	17	10
g. Corrective action for groundwater contamination	13	18	10	10	18	11
h. Air protection standard	4	15	22	7	11	21
i. Air emission monitoring	1	14	26	2	14	21
j. Surface water protection standards	24	16	1	14	18	6
k. Surface water monitoring	10	28	3	6	24	8
l. Corrective action for surface water contamination	14	25	2	7	22	9
m. Overtopping controls (freeboard)	11	28	2	7	23	8
n. Dike stability criteria	7	31	3	4	24	10
o. Restrictions on types of Subtitle D wastes received	10	25	6	8	18	12
p. Endangered species criteria	4	14	22	4	13	21
q. Disease vectors criteria	10	17	14	7	18	14
r. Safety criteria: Uncontrolled access	14	22	5	10	17	12
s. Closure standards (example: caps)	8	21	12	8	14	16
t. Postclosure monitoring	7	21	13	9	15	14
u. Financial responsibility	6	15	20	7	11	20

(continued)

Table 10.1 (Cont.)

SUBTITLE D SURFACE IMPOUNDMENT REGULATIONS

	Number of states with requirements included in current State Subtitle D program					
	Industrial waste			Agricultural waste		
	Specifically included in the regulations	Enforced under general standards and policies	No enforceable requirements	Specifically included in the regulations	Enforced under general standards and policies	No enforceable requirements
a. Location standards (e.g., floodplains)	13	26	4	10	24	9
b. Natural liners (e.g., clay)	7	30	5	4	27	11
c. Synthetic liners	5	29	8	3	26	13
d. Leak detection system	5	26	11	4	19	19
e. Groundwater protection standard	19	18	5	13	19	10
f. Groundwater monitoring	13	24	5	7	21	14
g. Corrective action for groundwater contamination	14	21	7	12	18	10
h. Air protection standard	6	13	23	5	11	26
i. Air emission monitoring	2	15	25	2	11	29
j. Surface water protection standards	26	16	0	24	13	5
k. Surface water monitoring	13	27	2	7	28	7
l. Corrective action for surface water contamination	15	25	2	14	21	6
m. Overtopping controls (freeboard)	9	31	2	10	25	7
n. Dike stability criteria	7	31	4	6	28	8
o. Restrictions on types of Subtitle D wastes received	8	29	5	4	26	12
p. Endangered species criteria	4	17	21	3	13	25
q. Disease vectors criteria	8	21	13	3	17	21
r. Safety criteria: Uncontrolled access	10	25	7	7	19	16
s. Closure standards (example: caps)	7	24	10	5	17	19
t. Postclosure monitoring	6	23	13	4	17	21
u. Financial responsibility	6	15	21	2	13	27

(continued)

Table 10.1 (Cont.)

SUBTITLE D SURFACE IMPOUNDMENT REGULATIONS

	Number of states with requirements included in current State Subtitle D program					
	Mining waste			Oil or gas waste		
	Specifically included in the regulations	Enforced under general standards and policies	No enforceable requirements	Specifically included in the regulations	Enforced under general standards and policies	No enforceable requirements
a. Location standards (e.g., floodplains)	11	23	7	9	18	10
b. Natural liners (e.g., clay)	6	25	9	4	24	8
c. Synthetic liners	5	25	10	4	23	9
d. Leak detection system	6	22	12	2	21	13
e. Groundwater protection standard	17	18	6	9	22	5
f. Groundwater monitoring	13	21	7	4	23	9
g. Corrective action for groundwater contamination	14	16	9	8	19	9
h. Air protection standard	8	11	21	4	8	24
i. Air emission monitoring	4	12	24	1	9	26
j. Surface water protection standards	22	15	3	17	16	3
k. Surface water monitoring	13	22	5	4	23	9
l. Corrective action for surface water contamination	15	20	5	7	22	7
m. Overtopping controls (freeboard)	13	21	6	9	18	9
n. Dike stability criteria	12	22	6	6	20	10
o. Restrictions on types of Subtitle D wastes received	10	20	10	5	17	13
p. Endangered species criteria	8	15	18	10	25	3
q. Disease vectors criteria	4	16	20	2	12	22
r. Safety criteria: Uncontrolled access	11	18	11	4	15	17
s. Closure standards (example: caps)	10	18	12	3	18	15
t. Postclosure monitoring	8	19	13	1	17	18
u. Financial responsibility	10	11	20	30	13	20

(continued)

Table 10.1 (Cont.)

SUBTITLE D SURFACE IMPOUNDMENT REGULATIONS

	Number of states with requirements included in current State Subtitle D program		
	Other		
	Specifically included in the regulations	Enforced under general standards and policies	No enforceable requirements
a. Location standards (e.g., floodplains)	8	7	2
b. Natural liners (e.g., clay)	5	8	4
c. Synthetic liners	4	8	5
d. Leak detection system	4	7	6
e. Groundwater protection standard	7	7	3
f. Groundwater monitoring	6	7	4
g. Corrective action for groundwater contamination	8	7	2
h. Air protection standard	5	2	10
i. Air emission monitoring	3	4	10
j. Surface water protection standards	13	4	0
k. Surface water monitoring	5	11	1
l. Corrective action for surface water contamination	7	10	0
m. Overtopping controls (freeboard)	7	8	2
n. Dike stability criteria	6	9	2
o. Restrictions on types of Subtitle D wastes received	6	9	2
p. Endangered species criteria	2	5	10
q. Disease vectors criteria	4	7	6
r. Safety criteria: Uncontrolled access	5	9	3
s. Closure standards (example: caps)	3	8	6
t. Postclosure monitoring	3	8	6
u. Financial responsibility	1	7	9

likely to be enforced under general standards and policies than specifically included in current Subtitle D programs.

Those requirements most often included specifically in State/Territory regulations, in descending order were:

- Surface water protection standard;
- Groundwater protection standard;
- Corrective action for surface water contamination;
- Location standards; and
- Safety criteria; uncontrolled access.

Those requirements for which States/Territories were the least likely to have any regulations were:

- Air emissions monitoring;
- Air protection standards;
- Financial responsibility;
- Closure standards; and
- Post closure monitoring.

10.2 Surface Impoundment Permitting/Licensing Requirements

The number of States and Territories requiring surface impoundment permits/plan approval and licenses/registration are presented in Table 10.2. The number of Subtitle D surface impoundments that have permits and licenses are presented in Table 10.3.

Table 10.2. Subtitle D permitting/licensing requirements: Surface impoundments

	Number of states with:			
	Permit or plan approval required		Licenses or registration required	
Surface impoundment type	Yes	No	Yes	No
Muncipal sewage sludge	39	5	1	42
Municipal run-off	26	18	1	42
Industrial waste	42	2	2	41
Agricultural waste	37	7	3	40
Mining waste	40	4	3	40
Oil or gas waste	33	11	1	42
Other	18	0	1	17

Table 10.3. Number of Subtitle D surface impoundments with permits/licenses

Surface impoundment type	Number of individual Subtitle D surface impoundments that have permits or plan approval	Number of individual Subtitle D surface impoundments licensed or registered
Muncipal sewage sludge	1,121	0
Municipal run-off	365	0
Industrial waste	7,747	354
Agricultural waste	10,505	210
Mining waste	11,218	77
Oil or gas waste	59,295	0
Other	5,227	0
TOTAL	95,478	641

10.3 State Enforcement Programs for Subtitle D Surface Impoundments

The frequency with which Subtitle D surface impoundments are inspected by States/Territories is presented in Table 10.4. Approximately 41 percent of all Subtitle D surface impoundments are inspected once every two years or less and about 12 percent of all Subtitle D surface impoundments are never inspected, according to study respondents. The total number of surface impoundment inspections made during 1984 for compliance with Subtitle D requirements is presented in Table 10.5. Estimates in Table 10.5 represent the total number of inspections made, rather than the number of surface impoundments inspected (e.g., multiple inspections may have been made at the same facility).

The total number and types of violations that were found in 1984 surface impoundment inspections is presented in Table 10.6. These estimates are a reflection of the following:

- the number of inspections conducted by States/Territories in 1984;
- the types of violations for which the 1984 inspections were made; and
- the availability of monitoring systems at the surface impoundments, as described in Section 7.4.4.

Table 10.4. Frequency of inspections of Subtitle D surface impoundments

	Municipal sewage sludge	Municipal run-off	Indus-trial waste	Agricul-tural waste	Mining waste	Oil or Gas waste	Other	TOTAL
Never inspected	37 (2.1%)	34 (7.1%)	191 (1.6%)	3,634 (24.2%)	658 (8.8%)	11,478 (11.9%)	3 (0.06%)	16,035 (11.6%)
Less than once every two years	401 (22.4%)	59 (12.3%)	2,981 (25.2%)	5,568 (37.1%)	927 (12.4%)	15,239 (15.7%)	104 (2.0%)	25,279 (18.2%)
Once every two years	208 (11.6%)	30 (6.3%)	2,835 (24.0%)	1,013 (6.7%)	3,294 (44.0%)	7,344 (7.6%)	108 (2.1%)	14,832 (10.7%)
Once a year	851 (47.4%)	106 (22.1%)	4,645 (39.3%)	2,918 (19.4%)	2,009 (26.8%)	60,152 (62.2%)	425 (8.2%)	71,106 (51.3%)
Twice a year	234 (13.0%)	24 (5.0%)	498 (4.2%)	413 (2.8%)	100 (1.3%)	1,426 (1.5%)	27 (0.5%)	2,722 (2.0%)
Four times a year	61 (3.4%)	82 (17.1%)	234 (2.0%)	3 (<0.1%)	51 (0.7%)	406 (0.4%)	222 (4.3%)	1,059 (0.8%)
More than four times a year	2 (0.1%)	138 (28.8%)	164 (1.4%)	0	206 (2.7%)	740 (0.8%)	0	1,250 (0.9%)
Other	0	6 (1.3%)	275 (2.3%)	1,465 (9.8%)	249 (3.3%)	0	4,324 (82.9%)	6,319 (4.6%)
TOTAL	1,794 (100%)	479 (100%)	11,823 (100%)	15,014 (100%)	7,494 (100%)	96,785 (100%)	5,213 (100%)	138,602 (100%)
Response rate	93%	98%	73%	88%	38%	77%	47%	72%

Table 10.5. Number of inspections of Subtitle D surface impoundments in 1984

Surface impoundment type	Number of inspections during 1984
Muncipal sewage sludge	1,079
Municipal run-off	1,768
Industrial waste	6,164
Agricultural waste	3,765
Mining waste	7,674
Oil or gas waste	26,340
Other	1,313
TOTAL	48,103

Table 10.6. Number of surface impoundments by type of violation in 1984

	Number and percent of active individual Subtitle D surface impoundments in violation in 1984:							
Violation type	Municipal sewage sludge	Municipal run-off	Indus-trial waste	Agricul-tural waste	Mining waste	Oil or gas waste	Other	TOTAL
Groundwater contamination	35 (1.8%)	32 (6.6%)	416 (2.6%)	29 (0.2%)	48 (0.2%)	111 (0.1%)	6 (0.1%)	677 (0.4%)
Groundwater monitoring program deficiencies	28 (1.4%)	12 (2.5%)	317 (2.0%)	34 (0.2%)	137 (0.7%)	110 (0.1%)	5 (<0.1%)	643 (0.3%)
Surface water contamination	24 (1.2%)	18 (3.7%)	279 (1.7%)	189 (1.1%)	249 (1.3%)	128 (0.1%)	22 (0.2%)	909 (0.5%)
Air contamination	20 (1.0%)	12 (2.5%)	145 (0.9%)	21 (0.1%)	5 (<0.1%)	10 (<0.1%)	0	213 (0.1%)
Operational deficiencies and other minor violations	137 (7.1%)	37 (7.6%)	616 (3.8%)	672 (3.9%)	534 (2.7%)	2,893 (2.3%)	18 (0.2%)	4,907 (2.6%)
Other violations	0	0	0	0	7 (<0.1%)	0	0	7 (<0.1%)

PART V

SMALL QUANTITY GENERATOR WASTE

Section 11. Small Quantity Generator Waste

PART V

SMALL QUANTITY GENERATOR WASTE

As pointed out in Section 1.1, Congress specifically directed the Administrator of the Environmental Protection Agency to evaluate and revise the "Criteria" for Subtitle D facilities that may receive hazardous waste or small quantity generator waste. These revisions are to include groundwater monitoring, location restrictions, and other corrective action, as appropriate. Also, within 18 months of the promulgation of the revised criteria, each State must develop a permit program or other system of prior approval and conditions to ensure that each facility that may receive hazardous household waste or small quantity generator waste is in compliance with the criteria.

Because of these requirements the census of State and Territorial Subtitle D non-hazardous waste programs included questions regarding the percentage of Subtitle D facilities (by type) that receive exempted non-household hazardous waste. A decision was made to use the term "non-household hazardous waste" in place of "small quantity generator hazardous waste" in the questionnaire because of varying definitions of what constitutes a "small quantity." The EPA criterion for small quantity generator waste changed while the survey was being conducted, from 1,000 kilograms per month to 100 kilograms per month.

11. SMALL QUANTITY GENERATOR WASTE

11.1 Quality of Exempted Non-household Hazardous Waste Receipt Data

Anecdotal evidence suggests that the estimates reported in this chapter are highly unreliable. The response rates for these estimates ranged from as low as 28 percent to as high as 100 percent. A bimodal distribution of responses clustered around the extremes -- no facility received exempted non-household hazardous waste, or all facilities received it. One State official initially refused to answer the question on exempted non-household hazardous waste, but then said that the answer should be zero because disposal of these wastes in Subtitle D facilities was not permitted by law in their State. Upon further reflection, this official Stated that probably all facilities had some exempted non-household hazardous waste since there was no mechanism to track this waste, or prevent it from entering the Subtitle D facilities. Most States admitted that they really did not know the extent of exempted non-household hazardous wastes being received by Subtitle D facilities.

In a telephone followup, many of these States mentioned household wastes when questioned about the type of small quantity generator wastes included in their estimates. When it was pointed out in the telephone editing procedures that household wastes were specifically excluded from the survey, their estimates did not change.

11.2 Estimated Percentage and Number of Subtitle D Facilities Receiving Non-Household Hazardous Waste

The percentage and number of landfills that were reported to receive exempted non-household hazardous waste is presented in Table 11.1. Over one-half of the municipal waste landfills, about 12 percent of the industrial waste landfills, and about 14 percent of the demolition debris landfills were said to receive such wastes. Twenty-seven percent of the landfills falling in the "other" category (primarily open dumps) were estimated to contain such wastes. Altogether, more than 5,000 landfills were estimated to receive exempted non-household hazardous waste.

The percentage and number of land application units that were reported to receive exempted non-household hazardous waste is presented in Table 11.2. Oil or gas waste land application units were said to have the highest percentage receiving such wastes (38.1%) but this category also had the lowest response rate (57%). Industrial waste land applications were reported to have the lowest percentage (3.1%) receiving such wastes. About 13 percent of the municipal sewage sludge land application units were reported to receive non-household hazardous waste, with about 16 percent of the high rate application units and about 11 percent of the low rate land application units receiving such wastes. Altogether, more than 1,600 land application units were estimated to receive exempted non-household hazardous waste.

The percentage and number of surface impoundments that receive exempted non-household hazardous waste is presented in Table 11.3. The estimates range from a high of almost 42 percent for the municipal run-off surface impoundments to a low of less than 1 percent for agricultural waste surface impoundments.

Altogether, more than 25,500 surface impoundments were estimated to receive exempted non-household hazardous waste.

Table 11.1 Number and percent of landfills that receive exempted non-household hazardous wastes

Landfill type	Response rate	Number of landfills	Percent of landfills
Municipal waste	88%	4,327	52.9%
Industrial waste	83%	360	12.3%
Demolition debris only	89%	312	13.5%
Other	28%	76	26.7%
TOTAL	83%	5,075	37.1%

Table 11.2 Number and percent of land application units that receive exempted non-household hazardous wastes

Land application unit type	Response rate	Number of land application units	Percent of land application units
Municipal sewage sludge at high application rate	-	33	16.4%
Municipal sewage sludge at low application rate	-	1,050	11.2%
Total municipal sewage sludge*	92%	1,382	12.6%
Industrial waste	95%	164	3.1%
Oil or gas waste	57%	101	38.1%
Other	100%	0	0%
TOTAL	91%	1,647	9.6%

*High rate application and low rate application may not equal the total municipal sewage figures because some states do not distinguish between high and low rate land application units.

Table 11.3 Number and percent of surface impoundments that receive exempted non-household hazardous wastes

Surface impoundment type	Response rate	Number of surface impoundments	Percent of surface impoundments
Municipal sewage sludge	75%	548	37.6%
Municipal run-off	77%	157	41.5%
Industrial waste	65%	1,541	14.7%
Agricultural waste	79%	88	0.7%
Mining waste	59%	824	7.0%
Oil or gas waste	77%	17,746	18.5%
Other	99%	5	<0.1%
TOTAL	75%	20,909	14.5%

PART VI

SUMMARY AND CONCLUSIONS

Section 12. Results

Section 13. Conclusions

PART VI
SUMMARY AND CONCLUSIONS

Part VI summarizes the results and conclusions of the Census of State and Territorial Subtitle D Solid Waste Programs. Results are presented in Section 12. Methodological results are summarized in Section 12.1. Substantive results pertaining to Subtitle D programs are summarized in Section 12.2. Conclusions are presented in Section 13.

12. RESULTS

12.1 Methodological Results

A mail questionnaire census was undertaken of all States and Territories having Subtitle D solid waste programs; all 50 States, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Marianas participated in the study. A 100 percent response was obtained, but the total amount of information that was provided, and the overall quality of the information varied greatly from one State and Territory to another. The District of Columbia reported no Subtitle D agencies or facilities and is not included in the results of this survey.

In general, nonresponse is an important factor to consider with respect to most of the estimates obtained in the Census of State and Territorial Subtitle D Nonhazardous Waste Programs. While a great deal of effort was expended by study respondents in the completion of study questionnaires and in followup telephone conversations, it was simply not possible for each State and Territory to provide estimates for each question in the study. In some cases, information was available in files or other records, but not in a format which could readily be retrieved. In other cases, the information could not be provided by States and Territories simply because no data whatsoever were available with which to project even rough estimates. Therefore, most estimates provided in this study are affected by nonresponse, some estimates to a larger degree than others. It is important to read the text when reviewing study estimates to assess the effect of nonresponse. Nonresponse is especially important with respect to estimates of dollars and hours expended on Subtitle D activities, estimates of surface impoundments, and estimates of industrial facilities.

The quality of the data provided in the Census of State and Territorial Subtitle D Nonhazardous Waste Programs varied greatly from one State and Territory to another and from one question to another within the same State or Territory. Data quality ratings were obtained from the respondents by telephone and through the use of a rating system built into the questionnaire. In general, the quality of the data with regard to municipal waste landfills is the highest of all estimates obtained in the study and the data with respect to surface impoundments is the lowest. Estimates which were obtained primarily through record searches (generally, number of inspections conducted, number of violations cited, number of permitted and licensed facilities) are believed to be somewhat more reliable than are data estimated without the benefit of records (generally, number of facilities having monitoring systems, number of facilities having release prevention mechanisms).

More detailed information regarding methodological results of the study can be found in Section 3, Statistical Reliability.

12.2 Substantive Findings

The major findings regarding the Subtitle D program are summarized in the points described below.

State Organization and Resources

1. A wide variety of agency types are reported to be involved in Subtitle D activities.

   The types of agencies listed by the States included, but were not limited to, solid waste and water agencies, departments of environmental protection or public health, oil and gas commissions, and bureaus of energy or geology. The States listed an average of 3 agencies. The distribution of States by number of agencies reported is shown in Figure 12.1.

2. The amount of money spent on Subtitle D programs varies widely by State.

   The average dollar amount reported to be spent on Subtitle D-related programs was $785,649 per State, with a range up to $9,476,255.

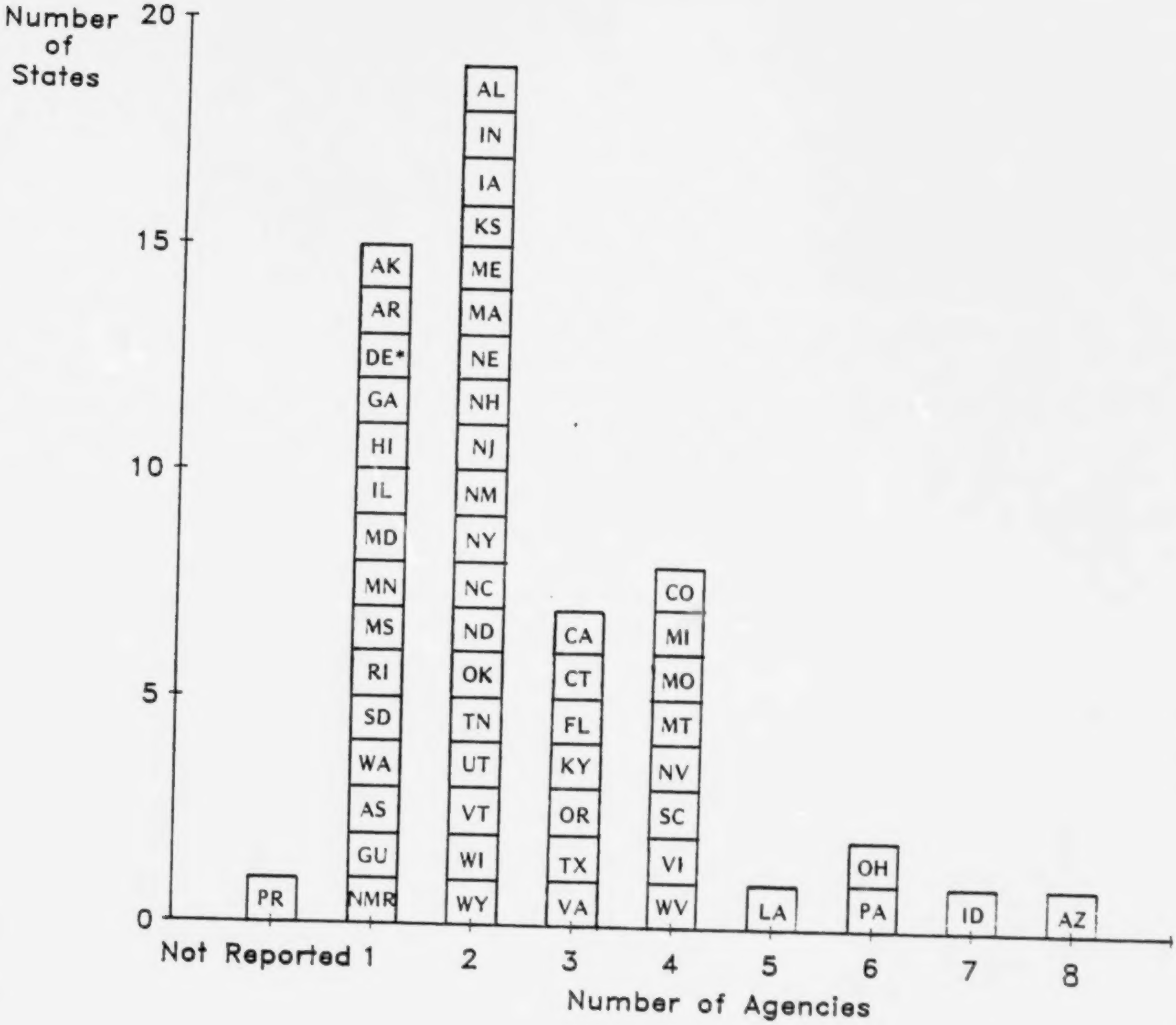
Number and Characteristics of Subtitle D Facilities

3. Approximately 227,000 Subtitle D facilities and 120,000 Subtitle D establishments were reported in the study.

   The total number of Subtitle D facilities in the United States and its Territories is as yet unknown due to the high level of nonresponse for particular types of facilities. Study estimates of the total number of surface impoundments, in general, and oil or gas waste surface impoundments, in particular, are likely to be large underestimates since many States and Territories could not even provide rough estimates of total numbers for these facility types.

   In addition, nine States that provided estimates of the numbers of at least some facility types were unable to provide estimates of the total number of establishments in their State/Territory. An "establishment" is a single physical location where business is conducted or where services or industrial operations are performed by a municipality, corporation, or other public or private entity. An establishment may have one or more landfills, land application units, and surface impoundments (i.e., one or more facilities).

Figure 12.1
NUMBER OF AGENCIES WITH SUBTITLE D RESPONSIBILITIES
REPORTED IN EACH STATE



* Delaware also has a public corporation "Authority" engaged in Subtitle D activities.

The total numbers and percentages of Subtitle D facilities by type that were reported in this study are provided in Table 12.1. Oil or gas waste surface impoundments represent by far the single largest category of Subtitle D facilities. They account for about 55 percent of all Subtitle D facilities. Municipal waste landfills, account for about 4 percent of all Subtitle D facilities.

4. Many of the Subtitle D facilities, within a given type, are highly concentrated in a few States.

   Figure 12.2 displays the percentage of facilities accounted for by the States with the largest number of facilities of each type. In most cases, more than half of the facilities were found in five or fewer States. Industrial and oil or gas land application units appear to be the most concentrated, with the top five States containing more than 80 percent of the facilities. Municipal waste landfills appear to be the least concentrated, with 34 percent of the facilities located in the top five States.

5. Most Subtitle D facilities are privately owned.

   Ownership was reported for about 184,000 of the 227,000 facilities reported in this study. Type of owner for each of the three major subcategories of Subtitle D facilities is presented in Table 12.2. Over 88 percent of all Subtitle D facilities are privately owned. Exceptions are municipal and demolition debris landfills, municipal sewage sludge, and municipal run-off/surface impoundments; these types of facilities are owned primarily by local governments.

6. In terms of acres of land, surface impoundments are the smallest Subtitle D facilities.

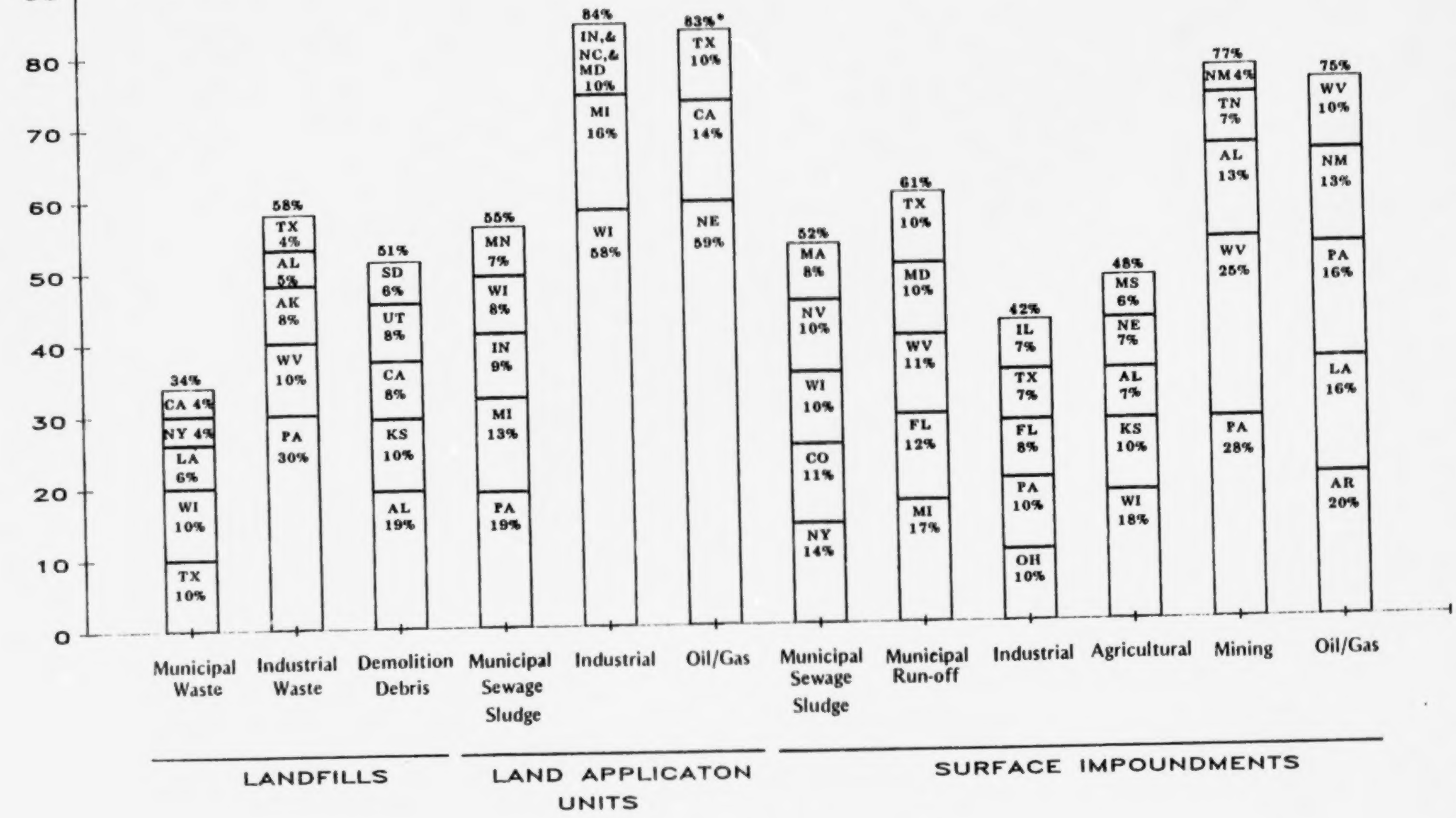
   Over 99 percent of Subtitle D surface impoundments are less than 10 acres in size, while 44.6 percent of landfills and 77.7 percent of land application units are larger than 10 acres. The size categories reported for Subtitle D facilities are summarized in Table 12.3. It should be noted that size category was reported for about 80 percent of landfills and land application units and only 63

Table 12.1. Reported number of Subtitle D facilities by type

	Reported total number	Percentage of total facilities
Landfills		
Municipal waste	9,284	4.1%
Industrial waste	3,511	1.5%
Demolition debris	2,591	1.1%
Other	1,030	0.5%
Subtotal	16,416	7.2%
Land application units		
Municipal sewage sludge	11,937	5.3%
Industrial	5,605	2.5%
Oil/gas	726	0.3%
Other	621	0.3%
Subtotal	18,889	7.6%
Surface impoundments		
Municipal sewage sludge	1,938	0.9%
Municipal run-off	488	0.2%
Industrial	16,232	7.1%
Agricultural	17,159	7.6%
Mining	19,813	8.7%
Oil/gas	125,074	55.1%
Other	11,118	4.9%
Subtotal	191,822	84.5%
TOTAL	227,127	100.0%

Figure 12.2

PERCENTAGE ACCOUNTED FOR BY THE FIVE STATES WITH THE LARGEST NUMBER OF SUBTITLE D FACILITIES BY TYPE



• KS, WV & WY account for an additional 8% of Oil/Gas Land Application Units

Table 12.2. Ownership of Subtitle D facilities

Ownership	Landfills	Land application units	Surface impoundments	Total
State government	1.7%	0.6%	0.1%	0.3%
Local government	53.8%	8.4%	1.6%	6.7%
Federal government	4.0%	0.6%	0.1%	0.5%
Private	40.5%	90.4%	98.2%	92.5%
Other	0.1%	0.0%	0.0%	<0.1%

Table 12.3 Number of Subtitle D Faciliites by acreage category

	<10 acres	10 - 100 acres	100+ acres	TOTAL
Landfills				
Municipal waste	2,944	3,572	449	6,965
Industrial waste	2,182	834	72	3,088
Demolition debris	1,327	797	64	2,188
Other	831	70	1	902
Subtotal	7,284	5,273	586	13,143
Percent	(54.4%)	(40.1%)	(4.5%)	(100%)
Land application units				
Municipal sewage sludge	2,077	6,356	1,378	9,811
Industrial	681	3,267	470	4,418
Oil/gas	568	113	45	726
Other	154	13	454	621
Subtotal	3,480	9,749	2,347	15,576
Percent	(22.3%)	(62.6%)	(15.1%)	(100%)
Surface impoundments				
Municipal sewage sludge	1,238	4	5	1,247
Municipal run-off	341	5	0	346
Industrial	6,108	380	70	6,558
Agricultural	11,707	102	0	11,809
Mining	6,166	257	17	6,440
Oil/gas	91,690	27	25	91,742
Other	5,268	2	0	5,270
Subtotal	122,518	777	117	123,412
Percent	(99.3%)	(0.6%)	(0.1%)	(100%)
TOTAL	133,282	15,799	3,050	152,131
Percent	(87.6%)	(10.4%)	(2.0%)	(100%)

percent of the surface impoundments reported in this study.

7. Very few Subtitle D facilities have extensive design and operational controls.

   Approximately 40 percent of all Subtitle D landfills have restrictions on the receipt of liquid waste, and 38 percent have run-on/run-off controls. On the other hand, only 12 percent of landfills are reported to have liners, and less than 4 percent have leachate collection systems.

   Over 75 percent of all Subtitle D land application units have waste application rate limits, 54 percent have waste restrictions, and 51 percent have run-on/run-off controls.

   Approximately 29 percent of all Subtitle D surface impoundments have liners, 27 percent have waste restrictions, and 25 percent have overtopping controls.

8. Very few Subtitle D facilities have systems to monitor releases.

   The percentages of Subtitle D facilities reported to have various monitoring systems are presented in Table 12.4 by facility type. Approximately 15 percent of all Subtitle D facilities are reported to have surface water monitoring systems, 5 percent are reported to have groundwater monitoring systems, and less than 1 percent are reported to have air monitoring systems. Approximately 3 percent of all landfills are reported to have methane monitoring systems. About 27 percent of all land application units are reported to have soil monitoring systems.

State Subtitle D Regulatory Programs

9. Subtitle D regulations vary by State or Territory.

   Most Subtitle D requirements were likely to be enforced under general standards and policies rather than specifically included in current Subtitle D programs. A detailed assessment of State and Territorial regulations discussing how the regulations vary will be found in the report, "Summary of Subtitle D Regulations" (in preparation).

Table 12.4 Percent of Subtitle D facilities having monitoring systems

	Percent of facilities with monitoring systems				
	Ground-water	Surface water	Air	Methane	Soil
Landfills					
Municipal waste	25.1	11.8	3.7	4.6	NA
Industrial waste	17.8	6.6	2.3	1.8	NA
Demolition debris	5.2	2.7	0.3	0.3	NA
Other	4.1	1.6	0.0	0.0	NA
Subtotal	19.1	8.6	2.7	3.0	NA
Land application units					
Municipal sewage sludge	2.8	2.2	0.8	NA	40.2
Industrial	10.6	2.4	0.6	NA	3.6
Oil/gas	34.0	31.7	5.1	NA	5.8
Other	0.5	0.0	0.0	NA	0.5
Subtotal	6.2	3.3	0.9	NA	26.8
Surface impoundments					
Municipal sewage sludge	6.8	2.6	0.5	NA	NA
Municipal run-off	39.3	11.7	0.0	NA	NA
Industrial	8.6	19.4	0.4	NA	NA
Agricultural	0.3	0.8	<0.1	NA	NA
Mining	27.2	43.8	0.1	NA	NA
Oil/gas	0.1	16.0	<0.1	NA	NA
Other	0.1	1.2	0.0	NA	NA
Subtotal	3.8	16.8	0.1	NA	NA
TOTAL	5.1	15.1	0.3	NA	NA

10. About 52 percent of the Subtitle D facilities have been issued permits by State agencies, about 48 percent have not.

    The number and percent of Subtitle D facilities having permits is presented in Table 12.5. Approximately 51 percent of all landfills, 66 percent of all land application units, and 50 percent of all surface impoundments were reported to have permits.

    In a few States, some of the facilities that have not been permitted are licensed as part of a separate registration program. These facilities were, for the most part, in existence when the current State regulations took effect. As such, these facilities were licensed under a "Grandfather" clause and have not been formally evaluated and approved. These licensed facilities are not included in Table 12.5.

11. States are concentrating their efforts on surveillance/enforcement activities and on the permitting of facilities.

    Surveillance and enforcement efforts were reported to account for 41 percent of the 1,814,439 hours devoted to Subtitle D activities by States and Territories. Permitting of facilities represented the next most frequently engaged in activity, with 28 percent of all hours being directly related to the review and approval of plans and the issuance of permits to operate. An additional 9 percent of the hours was directed towards technical assistance. When asked to rank these areas with respect to expected improvement with additional resources, respondents ranked surveillance and enforcement first, technical assistance second, and permitting or licensing third.

12. State surveillance/enforcement efforts resulted in approximately 89,000 inspections in 1984, while less than one-third of all Subtitle D facilities were inspected.

    The total reported number of inspections of Subtitle D facilities is summarized in Table 12.6. These numbers do not indicate how many facilities were actually inspected since a facility may have been inspected more than once. Approximately 54

Table 12.5 Number and percent of permitted facilities

	Number of facilities with permits	Percentage of total facilities
Landfills		
Municipal waste	5,444	58.6%
Industrial waste	1,392	39.6%
Demolition debris	1,377	53.1%
Other	209	20.3%
Subtotal	8,422	51.3%
Land application units		
Municipal sewage sludge	7,955	66.6%
Industrial	3,331	59.4%
Oil/gas	697	96.0%
Other	519	83.6%
Subtotal	12,502	66.2%
Surface impoundments		
Municipal sewage sludge	1,121	57.8%
Municipal run-off	365	74.8%
Industrial	7,747	47.7%
Agricultural	10,505	61.2%
Mining	11,218	56.6%
Oil/gas	59,295	47.4%
Other	5,227	47.0%
Subtotal	95,478	49.8%
TOTAL	116,402	51.2%

Table 12.6. Number and percent of state/territory inspections in 1984

Type	Number of inspections	Percent of the total number of inspections
Landfills		
Municipal waste	24,865	27.9%
Industrial waste	4,354	4.9%
Demolition debris	2,834	3.2%
Other	799	0.9%
Subtotal	32,852	36.9%
Land application units		
Municipal sewage sludge	5,326	6.0%
Industrial waste	1,601	1.8%
Oil/gas waste	1,124	1.3%
Other	34	<0.1%
Subtotal	8,085	9.1%
Surface Impoundments		
Municipal sewage sludge	1,079	1.2%
Municipal run-off	1,768	2.0%
Industrial	6,164	6.9%
Agricultural	3,765	4.2%
Mining	7,674	8.6%
Oil/gas	26,340	29.6%
Other	1,313	1.5%
Subtotal	48,103	54.0%
Total	89,040	100.0%

Notes: Percentages may not sum to 100% due to independent rounding.

The numbers reported here refer to the number of inspections made, not the number of facilities inspected (i.e., some facilities may have been inspected more than once in 1984).

percent of the 89,040 reported inspections were made of surface impoundments. Many of these inspections were made in response to State/federal water program regulations (e.g., NPDES) rather than Subtitle D regulations.

The frequency of inspection of Subtitle D facilities is summarized in Table 12.7. Approximately 42 percent of all Subtitle D facilities are reported to be inspected less than once each year. If this frequency distribution is used to estimate the number of facilities that may have been involved in the 89,040 inspections in 1984, it shows that approximately 30 percent of all Subtitle D facilities were inspected.

13. States report having cited 1,463 Subtitle D facilities for groundwater contamination, 1,793 Subtitle D facilities for surface water contamination, and 1,185 Subtitle D facilities for air contamination in 1984.

The numbers of violations for groundwater, surface water, and air contamination are presented in Table 12.8. Although landfills only accounted for 7 percent of the total number of Subtitle D facilities, 37 percent of the inspections conducted in 1984 were at landfills. Consequently, approximately 49 percent of all groundwater violations and about 80 percent of all air contamination violations were reported to have been cited at landfills. Surface water violations were more likely to have have been cited at surface impoundments, with about 51 percent of all surface water violations occurring at surface impoundments.

No data were requested in this study which could be used to determine the seriousness of the violations presented in Table 12.8. Respondents were directed to use that definition of contamination that applied to their own State or Territory when answering questions regarding groundwater, surface water, and air contamination. In addition, the overall extent of groundwater contamination from Subtitle D facilities cannot be determined because not all Subtitle D facilities have monitoring systems. Less than one-third of all Subtitle D facilities are inspected each year, according to reports in this study.

Table 12.7. Frequency of inspection of Subtitle D facilities

	Landfills	Land application units	Surface impoundments	TOTAL
Response Rate	91%	97%	74%	77%
Never inspected	864 (5.8%)	1,782 (9.8%)	16,035 (11.6%)	18,681 (10.9%)
Less than once every two years	935 (6.2%)	9,028 (49.5%)	25,279 (18.2%)	35,242 (20.5%)
Once every two years	1,472 (9.8%)	2,309 (12.7%)	14,832 (10.7%)	18,613 (10.8%)
Once a year	4,214 (28.1%)	2,627 (14.4%)	71,106 (51.3%)	77,947 (45.4%)
Twice a year	2,587 (17.3%)	845 (4.6%)	2,722 (2.0%)	6,154 (3.6%)
Four times a year	2,121 (14.2%)	123 (0.7%)	1,059 (0.8%)	3,303 (1.9%)
More than four times a year	2,618 (17.5%)	200 (1.1%)	1,250 (0.9%)	4,068 (2.4%)
Other	176 (1.2%)	1,307 (7.2%)	6,319 (4.6%)	7,802 (4.5%)
TOTAL	14,987 (100%)	18,221 (100%)	138,602 (100%)	171,810 (100%)

Note: The numbers reported here refer to the number of facilities that were to be inspected at these frequencies, not the number of inspections made.

Table 12.8. Groundwater, surface water and air contamination violations in 1984

	Number of active individual Subtitle D facilities in violation in 1984		
	Groundwater contamination	Surface water contamination	Air contamination
Landfills			
Municipal waste	586	660	845
Industrial waste	111	50	18
Demolition debris	16	42	33
Other	7	6	54
Subtotal	720	758	950
Land application units			
Municipal sewage sludge	17	17	12
Industrial	45	60	10
Oil/gas	2	25	0
Other	2	24	0
Subtotal	66	126	22
Surface Impoundments			
Municipal sewage sludge	35	24	20
Municipal run-off	32	18	12
Industrial	416	279	145
Agricultural	29	189	21
Mining	48	249	5
Oil/gas	111	128	10
Other	6	22	0
Subtotal	677	909	213
TOTAL	1,463	1,793	1,185

The number of facilities having groundwater monitoring systems, the number of facilities cited for groundwater contamination violations, and the percent of monitored facilities cited for groundwater contamination are reported in Table 12.9. Groundwater contamination was observed in 23 percent of the landfills that had groundwater monitoring systems, in 6 percent of the land application units that had groundwater monitoring systems, and in 9 percent of the surface impoundments that had groundwater monitoring systems.

Small Quantity Generator Hazardous Waste

14. Approximately 16 percent of all Subtitle D facilities are reported to receive exempted non-household hazardous waste (i.e., small quantity generator waste.)

The percentages of Subtitle D facilities receiving exempted non-household hazardous waste are summarized in Table 12.10. The reader should treat these estimates with caution for several reasons. First, the response rates for some facility types are as low as 28 percent. Second, the estimates are based on reports from the States that were highly skewed at either 0 percent or 100 percent of the facilities. Some States do not exempt small quantity generator waste in any amount, and for other States, the exempt amounts differ from the current EPA criterion.

Table 12.9. Groundwater monitoring systems/violations

	Facilities cited for ground-water contamination violations	Facilities having ground-water monitoring systems	Percent of monitored facilities having groundwater contamination
Landfills			
Municipal waste	586	2,331	25.1%
Industrial waste	111	626	17.7%
Demolition debris	16	135	11.9%
Other	7	42	16.7%
Subtotal	720	3,134	23.0%
Land application units			
Municipal sewage sludge	17	337	0.5%
Industrial	45	592	7.6%
Oil/gas	2	247	0.8%
Other	2	3	66.7%
Subtotal	66	1,179	5.6%
Surface Impoundments			
Municipal sewage sludge	35	131	26.7%
Municipal run-off	32	192	16.7%
Industrial	416	1,396	29.8%
Agricultural	29	44	65.9%
Mining	48	5,399	0.9%
Oil/gas	111	165	67.3%
Other	6	7	85.7%
Subtotal	677	7,334	9.2%
TOTAL	1,463	11,647	12.6%

Table 12.10. Percent of Subtitle D facilities receiving exempted non-household hazardous waste

	Response rate	Percent receiving exempted non-household hazardous waste
Landfills		
Municipal waste	88%	52.9%
Industrial waste	83%	12.3%
Demolition debris	89%	13.5%
Other	28%	26.7%
Subtotal	84%	37.1%
Land application units		
Municipal sewage sludge	92%	12.6%
Industrial	95%	3.1%
Oil/gas	57%	38.1%
Other	100%	0%
Subtotal	90%	9.6%
Surface impoundments		
Municipal sewage sludge	75%	37.6%
Municipal run-off	78%	41.5%
Industrial	65%	14.7%
Agricultural	79%	0.7%
Mining	59%	7.0%
Oil/gas	77%	18.5%
Other	99%	<0.1%
Subtotal	75%	14.5%
TOTAL	77%	15.7%

13. CONCLUSIONS

The general conclusions that can be drawn from the Census of State and Territorial Subtitle D Nonhazardous Waste Programs are summarized in the points below. Points 1, 2, and 3 concern the extent to which this study can be relied upon as an assessment of Subtitle D programs. Points 4, 5, and 6 represent the primary conclusions drawn by the authors of this study regarding the present status of State and Territorial Subtitle D programs.

1. _Due to high nonresponse rates for certain variables in the study, study data do not represent a complete picture of the status of Subtitle D programs_.

Estimates of _total_ _numbers_ presented in this report (e.g., total number of dollars expended on Subtitle D activities, total numbers of facilities, etc.) are likely to be _underestimates_ due to nonresponse. As pointed out in several sections of this report, it was simply not possible for all States to respond to all questions in the study. Lack of information and/or difficulty accessing existing information resulted in nonresponse which in turn resulted in underestimates of total numbers.

Estimates of _percentages_ produced as a result of this study (e.g.,percentage of facilities that are permitted, percentage of facilities that are inspected, percentage of facilities having monitoring systems or release prevention mechanisms, etc.) may be _biased_ somewhat due to the nonresponse.

2. Additional research could fill some of the gaps in this study. One national survey of certain facilities would be the most cost effective technique.

Some States and Territories could not provide the resources necessary to compile existing information to answer study questions, even though the information was available in a record-keeping system of some type within the State or Territory. In the majority of these cases, significant levels of funds would be required to identify, review, analyze, and compile existing information. Respondents on several occasions indicated that literally hundreds of hours of research would be required to review existing records to provide responses.

A more cost effective approach would be to conduct one national survey of certain facilities to obtain the necessary estimates. An example would be attempts to fill gaps on industrial Subtitle D facility types, for which there was great nonresponse in this study. Rather than conduct a total of 15 to 20 different industrial studies (one for each nonrespondent State), it would be much more cost effective (and equally reliable) to estimate the total number of industrial facilities in the United States through a single national survey.

3. Additional research efforts would be likely to add to estimates of total numbers obtained in this study, but they would not be likely to change the direction of the general trends found in the present data set.

With additional data collection efforts, it would be possible to add to the total number of facilities in the United States and to the total number of dollars and hours expended on Subtitle D activities, and to any other totals estimated in the study. Since this study is a census (with no projections from samples to the total population) every additional (non-zero) response would represent an addition to the totals.

If, for example, from the original data set it was estimated that 100,000 facilities of a given type existed and an additional research effort identified 10,000 more facilities of this type in nonrespondent State "X", the estimate could be revised from 100,000 to 110,000 facilities. A difference in the estimate of the true value would be produced and a change in the data set would be observed.

Such a difference would not likely affect , however, the original conclusions that only about half of the facilities are permitted, or that few facilities have monitoring systems or release prevention management systems. If anything, additional research efforts (because of the nature of the nonresponse) would be likely to bolster these observations. The additional 10,000 facilities from State "X", for example, are likely to include about the same percentage of permitted facilities or an even lower percentage (since if these facilities had permits they probably would have been included in the original data set). The additional 10,000 facilities are also likely to have about the same or an even lower percentage having monitoring systems, release prevention management systems, etc. for the same reason. Thus, overall conclusions and observed trends (such as the fact that few facilities have monitoring systems) are not likely to be changed as a result of additional data collection efforts.

4. Most States and Territories are conducting Subtitle D programs that do not address the full spectrum of Subtitle D facilities and activities.

State programs directed the largest portion of the total hours spent on Subtitle D activities in 1984 towards surveillance and enforcement, yet only 30 percent of the facilities were inspected in 1984. The second most frequent Subtitle D activity reported by the States was permitting/licensing (with the majority of the States requiring that Subtitle D facilities be permitted), yet only half of all facilities were permitted. These two areas are the ones that the States indicated would improve the most if additional resources were available. Of the 48 States that allocated hours by activity, only 30 directed any time to training and only 16 directed time to research.

During the telephone followup, many respondents reported that it was difficult or impossible to inventory some Subtitle D facilities and activities. Most States have more than one agency with responsibility for the same facilities (e.g., one agency responsible for permitting and another agency responsible for inspections). At the same time, there are facilities for which no agency has responsibility (e.g., some industrial waste facilities on-site where generated). Attempts to coordinate activities between agencies are difficult, with the end result that some types of facilities (in particular, municipal landfills) are being monitored more thoroughly than other types.

With the current array of Subtitle D programs, it would be difficult for many of the States and Territories to develop a complete inventory of Subtitle D facilities, carry out permitting programs that ensure the evaluation and approval of all facilities prior to operation, and include the inspection of each facility on a regular basis.

5. The frequency of occurrence of groundwater, surface water, and air contamination in Subtitle D facilities appears to be significant. However, additional research efforts are required to determine the severity of contamination at Subtitle D facilities, since it cannot be determined from this study.

State and Territorial inspection programs resulted in a total of 1,463 groundwater, 1,793 surface water, and 1,185 air contamination violations in 1984. What makes these numbers significant is that only 5 percent of all Subtitle D facilities had groundwater monitoring systems, only 15 percent had surface water monitoring systems, and less than 1 percent had air monitoring systems. Furthermore, 23 percent of all landfills with groundwater monitoring systems were found to have groundwater contamination, 6 percent of all land application units with monitoring systems were found to have groundwater contamination, and 9 percent of all surface impoundments with monitoring systems were found to have groundwater contamination in 1984.

The relative severity of "contamination" cannot be determined from this study, however, as each State and Territory was asked to use that definition of contamination that best applied to their own State/Territorial regulations. In order to determine the severity and potential impacts to human health and the environment of groundwater, surface water, and air contamination, additional research would be required.

6. Increased resources for State and Territorial Subtitle D programs is necessary to address the full spectrum of Subtitle D facilities and activities.

The present funding levels for State and Territorial Subtitle D programs are not supporting comprehensive programs encompassing the full spectrum of Subtitle D facilities and activities. Respondents reported that if additional funds were available, they would expect to see the most improvement in the areas of surveillance/enforcement and permitting/licensing. Increased funding would allow for activities such as permitting more Subtitle D facilities prior to operation, and the inspection of more facilities on a more frequent basis.

APPENDIX A

LANDFILL CAPACITY PROBLEMS

As part of the Landfill Section of the State Subtitle D Program Questionnaire, the States were asked to respond to the following:

> "Please describe any local, regional, or statewide landfill capacity problems in your State."

The responses are listed below, alphabetically, by State.

Alabama. Many of the landfills are reaching capacity. Very difficult to site new landfills due to technical requirements and public opposition.

Alaska. There is no capacity problem in Alaska as far as space, but in most areas the soil and topography are not suitable for landfills (wetlands and permafrost) due to the climate.

American Samoa. The existing landfill on the island of Tutuila is rapidly approaching capacity. With limited useable land, alternate methods of municipal waste disposal may have to be used, e.g., incineration, waste transfer to other islands.

Arizona. It is getting more difficult to site new landfills and this is causing a problem especially in the Phoenix Area, Maricopa, & Mojave Counties. Also, much of the land is federally owned and is leased on a highest bidder basis. Many of the area's lands are going back to private companies and this is causing problems siting landfills.

Arkansas. A few individual landfills are reaching capacity but no problems are foreseen in finding new locations. This is primarily due to a 1974 Arkansas ruling which said that landfills can only be turned down because of physical criteria siting problems but not public opposition. Additionally, zoning regulations are not restrictive in siting new landfills.

California. Most urban areas have capacity for only approximately 20 years--need to expedite planning for future capacity.

Colorado. There are 6 landfills which service the greater Denver metropolitan area. Within the next three years, two with a possible four landfills may close. At the present time, there are no new landfills proposed to replace these facilities. If no new landfills are permitted, the Denver area may face a critical shortage of landfill space.

Connecticut. The State of Connecticut is approaching a statewide capacity shortage, estimated to become critical in late 1988. Currently, 50% of the state's solid waste is going to 9 major regional landfills. These sites will all reach their permitted capacity at about the same time because the waste flow is easily diverted to the few remaining landfills. No new municipal waste fills have been permitted in Connecticut since 1978. The permitted landfills will be used up before the planned resource recovery projects are in operation.

Delaware. No capacity problems. Increased volume at landfills in Kent and Sussex County would allow economic resource recovery facilities to be built (similar to the one presently operating in New Castle County).

Florida. An evaluation of current and projected population growth in Florida indicates a need for an estimated equivalent 2,700 acres of additional landfill area, annually, through year 1995.

Georgia. Gwinnet County, Fulton County, Douglas County, Cobb County. The above counties are located in the Atlanta area and have problems locating and zoning new sites due to public opposition. All have limited remaining landfill capacity at existing sites.

Guam. Single municipal landfill owned and operated by Government of Guam will reach capacity in 1-2 years.

Hawaii. Statewide: shortage of suitable and available sites (no community opposition) for landfills is the major concern of all the counties. Except for the City and County of Honolulu, the amount of refuse generated per day on each of the counties is too small to consider refuse-to-energy as an aletrnate method of refuse disposal. City and County of Honolulu: the three municipal landfills are rapidly approaching their capacities; the two smallest landfills will be closed within 18 months and the largest within 3 years. The city is finalizing a contract with a private firm to design, construct, and operate a refuse-to-energy (RFD) plant.

Idaho. Approximately 12 landfills are in need of replacement due to capacity problems, 8 of which are the major or only landfill for the counties in which they are located.

Indiana. Please see attached map. (Map shows estimated lifetimes of all landfills in indiana.)

Iowa. No significant landfill capacity problems at this time statewide. Local capacity problems usually result in landfill expansion at nearby sites.

Louisiana. Lack of permitted disposal facilities for oil field waste encourages illegal dumping.

Kansas. None.

Kentucky. No response.

Maine. Some small communities, particularly those in the more remote areas not serviced by regional or commercial landfills or resource recovery projects, are in need of regional solutions. Many small municipal sites have little remaining capacity.

Maryland. Calculating the total disposal capacity for the state would be misleading. Each of the 23 Maryland Counties and Baltimore City is responsible for providing landfill capacity for its residents. This capacity at present ranges from less than one to more than 25 years. There is no programmatic mechanism for moving waste from an area with a capacity shortage to an area with a capacity surplus. The Draft State Solid Waste Plan found, in early 1985, that eight of the 24 jurisdictions had less than five years disposal capacity under permit.

Massachusetts. The capacity of Massachusetts' active landfills is actively running out. [Plus an additional page of text.]

Michigan. The capacities for solid waste disposal areas are addressed as part of the solid waste management plans which are required to be developed pursuant to act 641.PA1978. The plan requires each county to identify disposal sites which will accept solid waste generated within their political boundaries for a 5 year period. The plans are to be updated every 5 years with new sites identified as necessary.

Minnesota. Many landfills have 5 years or less for capacity and some disposal option will be needed. However, we are stressing reuse of the waste and will need less capacity. Other landfills have as much as 20-40 years left.

Mississippi. Within 5 years only about 5% of our landfills in Mississippi will need new sites. We expect more recycling and incineration. In general there are no landfill capacity problems.

Missouri. No response.

Montana. Statewide many of the existing landfills are nearing capacity. In general it is very difficult to obtain new sites for landfills.

Nebraska. One municipality (pop 18,000) has been unable to site a landfill and is transferring refuse 50 miles to another site. One major landfill has less than two years remaining life with no known effort to find a replacement at this time. Another major landfill with about the same remaining life serves 180,000 people. The city involved is seeking a new site.

Nevada. None at this time.

New Hampshire. Many landfills are reaching capacity. Also a large number have shown leachate breakouts and are under closing orders. As a result, many towns are opting for refuse-to-energy facilities.

New Jersey. Capacity problems are very severe across the state. Siting due to public opposition is the largest contributing factor to the capacity problem.

New Mexico. There are currently 61 landfills on federal land and 12 on state land. Both entities have told the landfills that as leases expire to find new land or purchase the existing land at current market rates. Communities either do not have the funds for purchase or no other land is available or suitable. Also the "not in my backyard" syndrome is beginning to come forth in New Mexico.

New York. No response.

North Carolina. The biggest issue facing landfill operators is economic considerations needed to construct and maintain landfill facilities. With stringent rules in place for protection of the environment, new techniques and technologies are mandated for protecting the environment.

North Dakota. There are no capacity problems at this time in North Dakota.

Northern Marianas. The only solid waste facility at the present time is an open dump and although there are no capacity problems we are looking for a new site for a landfill. We hope to find a suitable site in the not too distant future.

Ohio. There are 41 counties (out of 88) that will reach landfill capacity within four years. These are major municipal landfills that accept general solid waste (in the 41 counties).

Oklahoma. Almost every area of the state experiences some landfill capacity problems. The primary problem facing the state, however, is the lack of new landfills. Rising costs of operation, more stringent permitting requirements, and increasing public opposition has caused many landfills to close at capacity and not permit new sites.

Oregon. Unable to estimate. Most areas of state have at least 5 years remaining life. The Portland Metropolitan Area with over one half of the state population has less than 4 years life with no new site identified. The Portland Metropolitan Area landfill that serves 4 counties is scheduled for closure in 1989. We are looking for a new site but have not found one yet. By July 1987 they hope to find a site. Rest of state has no real capacity problems.

Pennsylvania. Problems in landfills are especially acute in Southeast Pennsylvania. This is primarily because of three factors: 1) closure of "full" landfills; 2) closure of substandard landfills; and 3) public resistance. The Delaware and Lehigh Valleys have only a 2-3 year capacity and include 40% of the state population. Overall, the state has an estimated landfill capacity of about 6 years.

Puerto Rico. The landfill capacity problem is enormous in all Puerto Rico. Almost all of the landfills operating in the Commonwealth are at the last portion of their useful life. Since Puerto Rico is a small island characterized mainly by high population densities and surface water bodies throughout all the country, it is very difficult to obtain additional land for landfill expansion or relocation. Therefore, this critical problem will only be solved by looking toward other solid waste alternatives (such as incineration).

Rhode Island. Many landfills nearing capacity. Three landfills active in 1984 have closed.

South Carolina. Eight to 10 sites need additional acreage within the next year and two of these sites are at capacity right now.

South Dakota. There are no existing capacity problems in South Dakota.

Tennessee. The urban areas, due to population densities, property of adequate acreage, and approvable geology, are difficult to acquire. The public pressure to reject siting is also a factor. This situation is acute in the Middle Tennessee Area as geologically approvable sites are so difficult to locate.

Texas. Replacement landfills in most urban areas are coming under increasing public opposition. This has significantly increased the time required to process a permit which diverts resources from other applications and causes an ever increasing backlog in permit evaluation.

Utah. Capacity is not a big problem but there are some localized problems with siting, especially in the industrial landfills which are in heavily populated areas and don't want to haul waste long distances.

Vermont. The Vermont Agency of Environmental Conservation recognizes two regional solid waste (i.e., landfill) capacity problems. Both regions lack landfill volume to dispose of solid waste generated within the region. Solid waste must be transported excessive distances to approved landfills. New landfills are not being developed due to lack of acceptable land, lack of resources to develop landfills and/or regulations. One region has committed to an alternative disposal method, which has not been implemented due to regulatory and environmental issues. A state wide capacity problem has also been identified. "Approved" solid waste disposal capacity project for the year 1990 is estimated to be 573,000 cubic yards to dispose of a projected 983,000 cubic yards of solid waste.

Virginia. Public resistance to siting of new facilities has caused delays in providing new facilities. Therefore, many landfills are near full and some are in heavily populated areas. Some municipal governments have moved to resource recovery facilities or contracted disposal as an alternative.

Virgin Islands. No response

Washington. There are no capacity problems now but rather siting problems for the future for new locations especially in the metropolitan areas of Spokane and Seattle. Lack of sites and appropriate land to build landfills is primarily due to public resistance and lack of necessary geographic locations. Planning is being done for other methods of disposal such as resource recovery and burning.

West Virginia. 1) Approximately 50% of municipal solid waste generated in west virginia is disposed at unpermitted facilities; 2) approximately 50% of permitted sites within 3 to 5 years of exhaustion of space/capacity; 3) northeast area of West Virginia has had severe flood damage to solid waste disposal facilities; 4) older permitted sites were designed without adequate consideration of capacity; 5) we believe we will have a 70% shortfall of capacity in 3 to 5 years if something is not done to improve conditions.

Wisconsin. Capacity problems are mostly short-term and localized. Long-distance hauling sometimes needed on an interim basis. Replacement (new or expanded) landfills are being sited in state at rate of about 10-20/year. State siting process is the same for both new and expanded landfills. It is a long process (2-5 years), but does allow siting to take place.

Wyoming. A few areas of tHe state now have capacity problems, mainly Teton County, near Yellowstone, which is having a problem siting a landfill. The Federal Bureau of Land Management is no longer leasing land cheaply and in the next ten years siting will be a statewide problem.

Appendix B

LANDFILL TIPPING FEES

Respondents were asked to report the typical landfill tipping fees across their state. Non-sludge typical tipping fees are presented on a per ton basis in Table B.1 and on a per cubic yard basis in Table B.2 for the same facility types. Typical tipping fees for sludges for municipal, industrial, demolition debris and other landfills are presented on a per ton basis in Table B.3 and on a per cubic yard basis in Table B.4. The number of states which provided responses to this question is low and the averages displayed in the table below may not be representative of most landfills.

Table B.1. Tipping fees for non-sludge solid waste in dollars per ton*

Landfill type	Typical tipping fees (per ton)	Range (per ton)
Municipal waste	$12.38(19)	$2.00(16) to $45.00(20)
Industrial waste	$14.96(4)	$1.00(4) to $50.00(4)
Demolition debris only	$11.50(7)	$1.00(5) to $50.00(7)
Other	$ 6.25(2)	$1.00(1) to $24.00(2)

*Numbers in parentheses beside each estimate indicate the number of states/territories responding.

Table B.2. Tipping fees for non-sludge solid waste in dollars per cubic yard*

Landfill type	Typical tipping fees (per cu. yd.)	Range (per cu. yd.)
Municipal waste	$2.11(10)	$ .50(9) to $10.00(10)
Industrial waste	$2.50(3)	$1.00(3) to $10.00(3)
Demolition debris only	$2.06(4)	$1.00(4) to $10.00(4)
Other	$ (0)	$ (0) to $ (0)

*Numbers in parentheses beside each estimate indicate the number of states/territories responding.

Table B.3. Tipping fees for sludges in dollars per ton*

Landfill type	Typical tipping fees (per ton)	Range (per ton)
Municipal waste	$11.98(10)	$ 4.50(10) to $45.00(10)
Industrial waste	$11.82(3)	$ 4.00(3) to $25.00(3)
Demolition debris only	$40.00(1)	$10.00(2) to $72.00(2)
Other	$ 2.50(1)	$ 1.00(1) to $ 3.50(1)

*Numbers in parentheses beside each estimate indicate the number of states/territories responding.

Table B.4. Tipping fees for sludges in dollars per cubic yard[*]

Landfill type	Typical tipping fees (per cu. yd.)	Range (per cu. yd.)
Municipal waste	$5.75(5)	$1.50(5) to $12.00(5)
Industrial waste	$3.50(2)	$1.00(2) to $ 8.00(2)
Demolition debris only	$1.38(1)	$1.00(1) to $ 1.75(1)
Other	$ (0)	$ (0) to $ (0)

[*] Numbers in parentheses beside each estimate indicate the number of states/territories responding.

APPENDIX C

EXHIBITS

Exhibit C.1 EPA Cover Letter

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

[ADR]

Dear [Name]:

The recently enacted Hazardous and Solid Waste Amendments (HSWA) of 1984 require significant changes to our current solid and hazardous waste regulatory program and mandate the completion of numerous studies. Section 302 of HSWA requires that the Environmental Protection Agency (EPA) complete a study addressing the adequacy of the current Federal Subtitle D (i.e., non-hazardous waste) standards in protecting human health and the environment from ground-water contamination. The current standards are entitled, "Criteria for Classification of Solid Waste Disposal Facilities and Practices" and are found in 40 CFR Part 257. EPA must submit the results of this study in a report to Congress by November 8, 1987. In addition, EPA must revise these standards by March 31, 1988, for facilities that may receive household hazardous waste or small quantity generator hazardous waste.

Enclosed is EPA's State Subtitle D program questionnaire. We request your cooperation in completing this survey. This State Subtitle D Survey is one of several projects EPA has initiated to gather the data necessary to carry out the above Congressional mandates. This survey addresses critical data needs related to State Subtitle D programs (e.g., resources, regulations, etc.) and characteristics of Subtitle D landfills, surface impoundments, and land application units.

The enclosed questionnaire has been reviewed extensively within EPA and by an Association of State and Territorial Solid Waste Management Officials (ASTSWMO) Subtitle D Study Work Group, which consisted of representatives from seven States. ASTSWMO's support is expressed in the enclosed letter. The questionnaire has also been reviewed and approved by the Office of Management and Budget. Further, the questionnaire has been pretested in nine States by having those States complete the forms. Each State was then contacted to discuss any problems that were encountered in providing the requested information. Our goal in using this rigorous approach to develop the questionnaire was to include only critical questions, eliminate wording ambiguities, and make the instructions as clear as possible.

The enclosed questionnaire is divided into four parts: State organization and resources, landfills, land application units, and surface impoundments. We divided the questionnaire in this way to make it easier to distribute to other groups in your State that may have responsibility for the specific subject areas addressed. For your convenience, we have enclosed a master copy and three extra copies of the questionnaire. If you need additional copies, please contact Westat, Inc., who is under contract to administer the survey, toll-free at (800) 638-8985.

Please return the completed master copy of the questionnaire in the enclosed return envelope by Friday, November 8, 1985. We urge you to begin work on the questionnaire as soon as possible because coordinating its completion will likely take considerable time. If you have any specific questions when completing the questionnaire, please do not hesitate to call the EPA Subtitle D specialist at Westat, Inc., at the toll-free number provided above. If you need additional time, or have general questions on the purpose or use of the survey, please contact Mike Flynn (202-382-4489) of my staff.

Obviously, it is very important that you complete the questionnaire to the best of your ability and describe the situation in your State as accurately as possible. The information you provide is critical in defining the current status of Subtitle D facilities and State Subtitle D programs. We will provide ASTSWMO with a copy of the raw data and work closely with them in developing the survey report. Of course, we will provide you with a copy of the survey report when it is completed.

Again, thank you very much for your cooperation.

Sincerely,

Michael B Cook

for John H. Skinner
Director
Office of Solid Waste

Enclosures

Exhibit C.2 ASTSWMO Cover Letter

Association of State and Territorial Solid Waste Management Officials
444 North Capitol Street, N.W. • Washington, D.C. 20001 • 202-624-5828

August 30, 1985

Dear State Colleague:

As chairman of the Association of State and Territorial Solid Waste Management Officials (ASTSWMO) workgroup on the Subtitle D survey, I, along with my fellow workgroup members, join with the U.S. Environmental Protection Agency in providing you with the Subtitle D survey of non-hazardous solid waste facilities.

The group was formed in order to work with USEPA in the development of the questionnaire. Three meetings were held with USEPA staff over the months of April and May of this year to review and discuss the draft survey instruments. The workgroup represented a cross-section of states. In addition to my own state of Connecticut, the states of Arkansas, California, Georgia, Maryland, New York and Texas participated in the survey development.

Draft surveys were evaluated on the basis of the kinds of information available within our respective states on Subtitle D programs. Revisions to the questionnaire were recommended so that the data requested corresponds, to the extent possible, with the types of information compiled by state agencies.

Each successive draft of the survey incorporated changes suggested at the prior meeting of the ASTSWMO/EPA workgroup. We appreciate USEPA's responsiveness to our concerns and comments. Following a decision by our Board of Directors, USEPA has agreed to provide ASTSWMO with copies of the raw data from the surveys for our own information on the status of state Subtitle D programs.

The attached survey represents a joint effort on the part of ASTSWMO and USEPA, and we join with USEPA in transmitting the survey to you.

Sincerely,

Charles Kurker

Charles Kurker, CT
Chairman
ASTSWMO Subtitle D
Workgroup

APPENDIX D

STATE SUBTITLE D PROGRAM QUESTIONNAIRE

U.S. ENVIRONMENTAL PROTECTION AGENCY

State Subtitle D Program Questionnaire

August 30, 1985

U.S. ENVIRONMENTAL PROTECTION AGENCY

State Subtitle D Program Questionnaire

GENERAL INSTRUCTIONS

GENERAL INSTRUCTIONS

PLEASE READ THE FOLLOWING INSTRUCTIONS BEFORE YOU BEGIN TO FILL OUT THE QUESTIONNAIRES ENCLOSED IN THIS PACKET. IF YOU SHOULD NEED FURTHER ASSISTANCE, INFORMATION ENABLING YOU TO MAKE THE APPROPRIATE CONTACTS IS PROVIDED AT THE END OF THESE INSTRUCTIONS.

OVERVIEW OF THE SURVEY

Your cooperation in this survey will enable EPA to evaluate the effectiveness of its RCRA Subtitle D waste guidelines (40 CFR, Part 257) as implemented by the States. These Subtitle D guidelines govern "non-hazardous" wastes not covered by Federal Subtitle C hazardous waste regulations. The survey will be completed by all U.S. States and Territories. The data collected through this survey will be factored into a series of economic and environmental analyses designed to determine the effectiveness of current guidelines and regulations and to recommend measures to Congress that would improve the effectiveness of regulating Subtitle D wastes.

In order to minimize the burden imposed by this information collection effort, we have developed the questionnaire design in close cooperation with members of the State and Territorial Solid Waste Management Officials (ASTSWMO) and have limited the scope of this survey to EPA's most critical information gaps. By working with ASTSWMO members, EPA was able to eliminate many questions that would have been difficult and time-consuming to answer. The responses you provide will contribute to the computation of much-needed nationwide estimates and to the formulation of EPA's recommendations to Congress.

THE QUESTIONNAIRE

A four-part questionnaire has been developed for this effort in recognition of the fact that responsibilities for the Subtitle D program are diverse and are often split between State or Territorial agencies, offices, or individuals. The separate parts are:

- PART I - STATE ORGANIZATION AND RESOURCES;
- PART II - LANDFILLS;
- PART III - LAND APPLICATION UNITS; and
- PART IV - SURFACE IMPOUNDMENTS.

Part I of the questionnaire contains budget and human resource questions. Parts II, III and IV each contain questions in six information areas:

- Regulations;
- Enforcement;
- Number of Units and Numbers of Establishments;
- Design and Operating Characteristics;
- Availability of Data; and
- Contact Information.

USE OF THE QUESTIONNAIRE

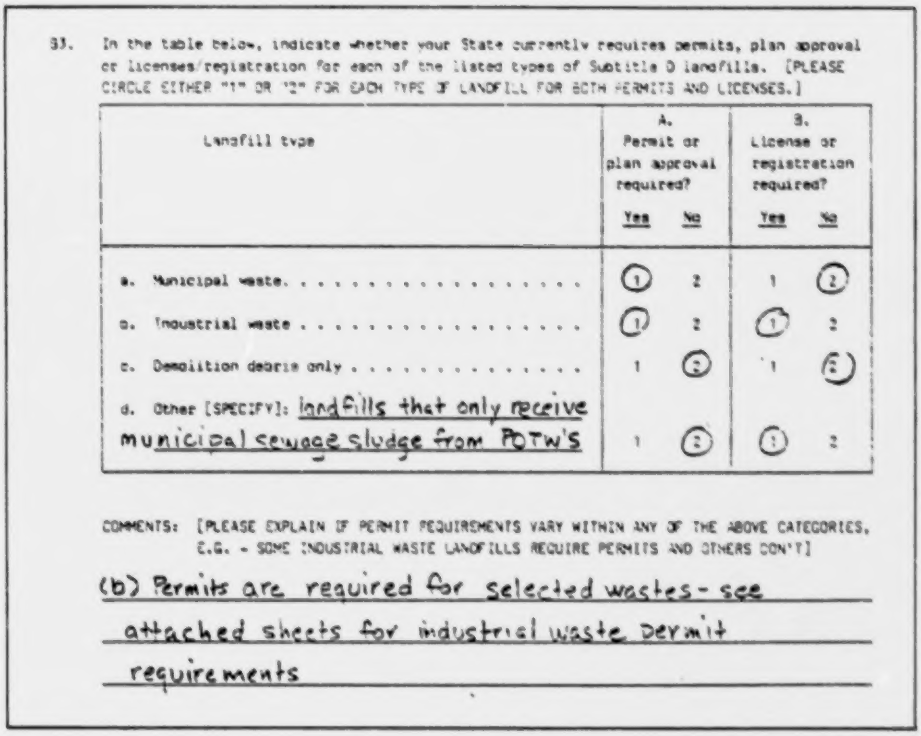
The questionnaires used for this survey have been designed to minimize the effort required for their completion. Great care has been taken to eliminate wording ambiguities and to make the instructions as explicit as possible. We hope you will find that by carefully following all of the instructions (in capital letters) you should encounter few, if any difficulties. However, if you do have difficulty, a toll-free assistance number is provided at the back of these General Instructions.

EXAMPLES OF QUESTIONS

Most of the questionnaire items are straightforward and require only the circling of the correct code(s) or the completion of short answers on the lines which are provided. The following examples illustrate the use of other question formats found throughout the questionnaires.

Example A

Some questions require that you code a "yes" or "no" answer for each method listed, as indicated in the sample question below. Notice also that in subquestion d, the "Other [Specify]" line enables you to enter a type not covered by the preprinted response categories. Some questions also leave space for comments as in the example below. More often, however, space for comments is provided at the end of each questionnaire part, or you may add attached sheets.



33. In the table below, indicate whether your State currently requires permits, plan approval or licenses/registration for each of the listed types of Subtitle D landfills. [PLEASE CIRCLE EITHER "1" OR "2" FOR EACH TYPE OF LANDFILL FOR BOTH PERMITS AND LICENSES.]

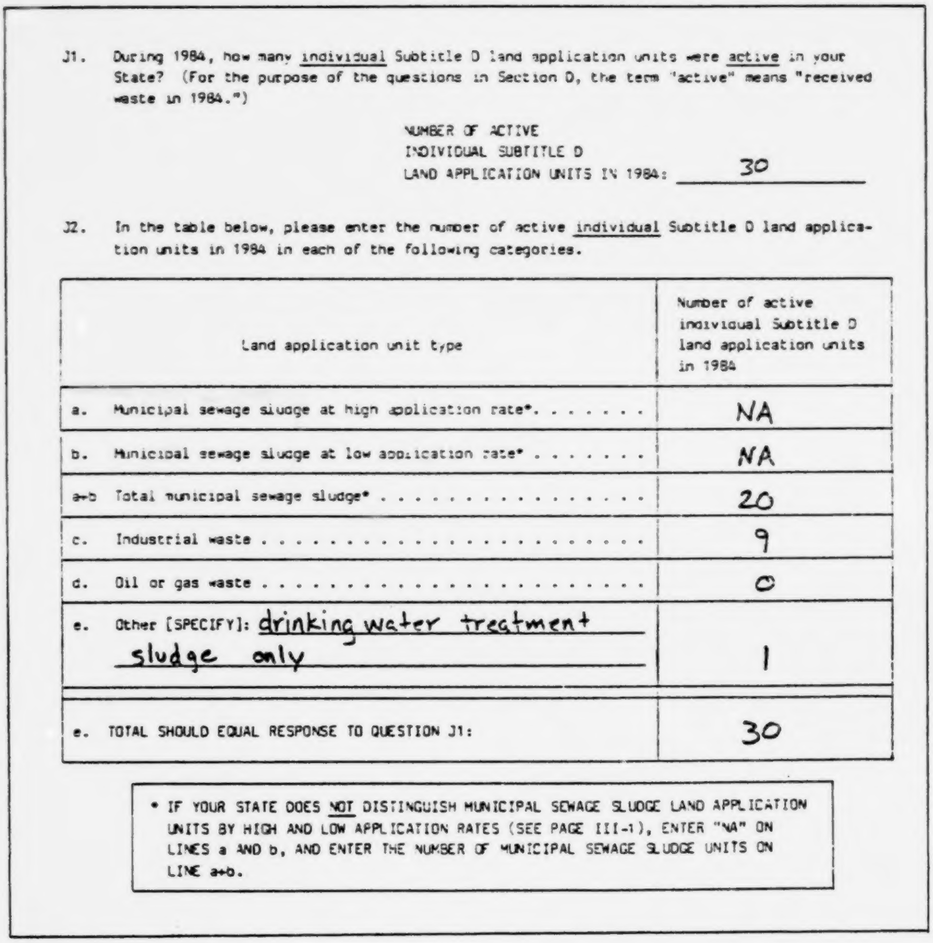
Landfill type	A. Permit or plan approval required?		B. License or registration required?	
	Yes	No	Yes	No
a. Municipal waste	[✓ 1]	2	1	[✓ 2]
b. Industrial waste	[✓ 1]	2	[✓ 1]	2
c. Demolition debris only	1	[✓ 2]	1	[✓ 2]
d. Other [SPECIFY]: landfills that only receive municipal sewage sludge from POTW's	1	[✓ 2]	[✓ 1]	2

COMMENTS: [PLEASE EXPLAIN IF PERMIT REQUIREMENTS VARY WITHIN ANY OF THE ABOVE CATEGORIES, E.G. - SOME INDUSTRIAL WASTE LANDFILLS REQUIRE PERMITS AND OTHERS DON'T]

(b) Permits are required for selected wastes - see attached sheets for industrial waste permit requirements

Example B

Some questions require a number to be entered. Please make certain that the detailed data add up to the totals, and that these totals are consistent with previous answers as in the sample questions below. If the answer is zero, enter "0." DO NOT LEAVE IT BLANK.



J1. During 1984, how many individual Subtitle D land application units were active in your State? (For the purpose of the questions in Section D, the term "active" means "received waste in 1984.")

NUMBER OF ACTIVE INDIVIDUAL SUBTITLE D LAND APPLICATION UNITS IN 1984: 30

J2. In the table below, please enter the number of active individual Subtitle D land application units in 1984 in each of the following categories.

	Land application unit type	Number of active individual Subtitle D land application units in 1984
a.	Municipal sewage sludge at high application rate*.	NA
b.	Municipal sewage sludge at low application rate*	NA
a+b	Total municipal sewage sludge*	20
c.	Industrial waste	9
d.	Oil or gas waste	0
e.	Other [SPECIFY]: drinking water treatment sludge only	1
e.	TOTAL SHOULD EQUAL RESPONSE TO QUESTION J1:	30

* IF YOUR STATE DOES NOT DISTINGUISH MUNICIPAL SEWAGE SLUDGE LAND APPLICATION UNITS BY HIGH AND LOW APPLICATION RATES (SEE PAGE III-1), ENTER "NA" ON LINES a AND b, AND ENTER THE NUMBER OF MUNICIPAL SEWAGE SLUDGE UNITS ON LINE a+b.

Example C

Some questions require a percentage to be entered. Please answer in the nearest whole percentage (i.e., do not use fractions or decimals). Also make sure your percentages add up to 100 percent as in the example below.

A4. What percentage of your State's total Subtitle D budget for fiscal years 1984 and 1985 came from the following sources: [ENTER THE PERCENTAGE RECEIVED FROM EACH FUNDING SOURCE FOR EACH YEAR. THE TOTAL OF THE PERCENTAGES FOR EACH YEAR SHOULD EQUAL 100%]

Funding source	Fiscal year ending in 1984	Fiscal year ending in 1985
a. State sources	94 %	99 %
b. Federal sources (please include any Subtitle D related funding for water programs)	5 %	0 %
c. License or user fees.	1 %	1 %
d. Other [SPECIFY]: ________________	0 %	0 %
TOTAL OF LINES a, b, c AND d FOR EACH FISCAL YEAR SHOULD EQUAL 100%:	100%	100%

SKIP INSTRUCTIONS

Skip instructions indicate the next question to be answered. They save time by allowing you to ignore irrelevant questions. When you encounter a skip instruction, continue on with the question indicated in the instruction. The following is an example:

R4. Does your State already have a list (or file) of establishments with Subtitle D surface impoundments?

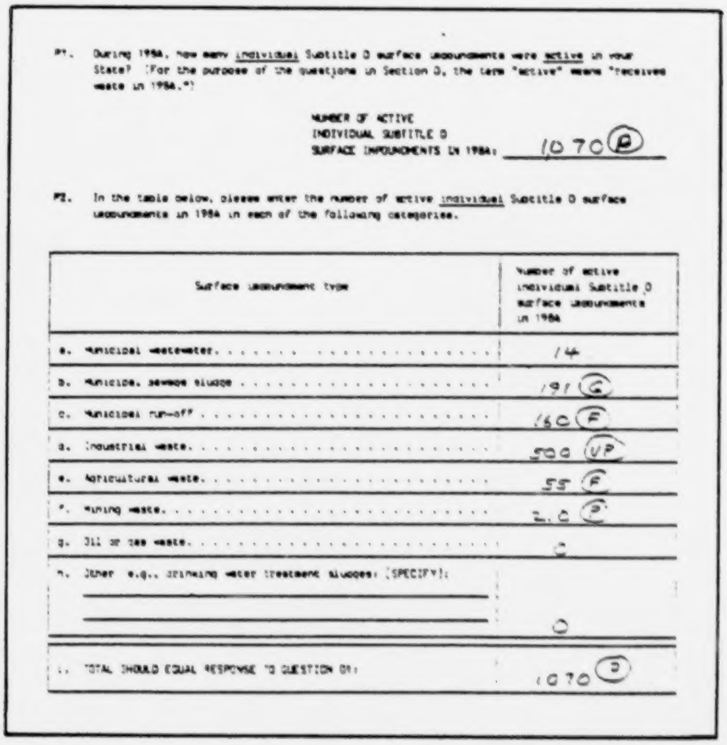
Yes [GO ON TO QUESTION R5]. 1
No [SKIP TO QUESTION S1]. 2

MAKING ESTIMATES

Some questions may require data that are not available or not known precisely. DO NOT LEAVE THESE BLANK. In these cases, please enter your best estimate of the data and indicate your assessment of the data quality by entering and circling one of the following letters after your answers. USE THE SYMBOLS BELOW WHENEVER YOU ARE ESTIMATING AN ANSWER.

(G) = Good estimate (i.e., probably within ± 10%)
(F) = Fair estimate (i.e., probably within ± 25%)
(P) = Poor estimate (i.e., probably within ± 50%)
(VP) = Very Poor estimate (i.e., probably not within ± 50%, or you don't have any idea how good the estimate may be)

In the example below, subquestions b through f of Question P2 have been estimated and the data quality indicated. Subquestion i is also an estimate and should be entered in an identical manner in Question P1. Subquestions a, g, and h are known exactly and need no symbols.



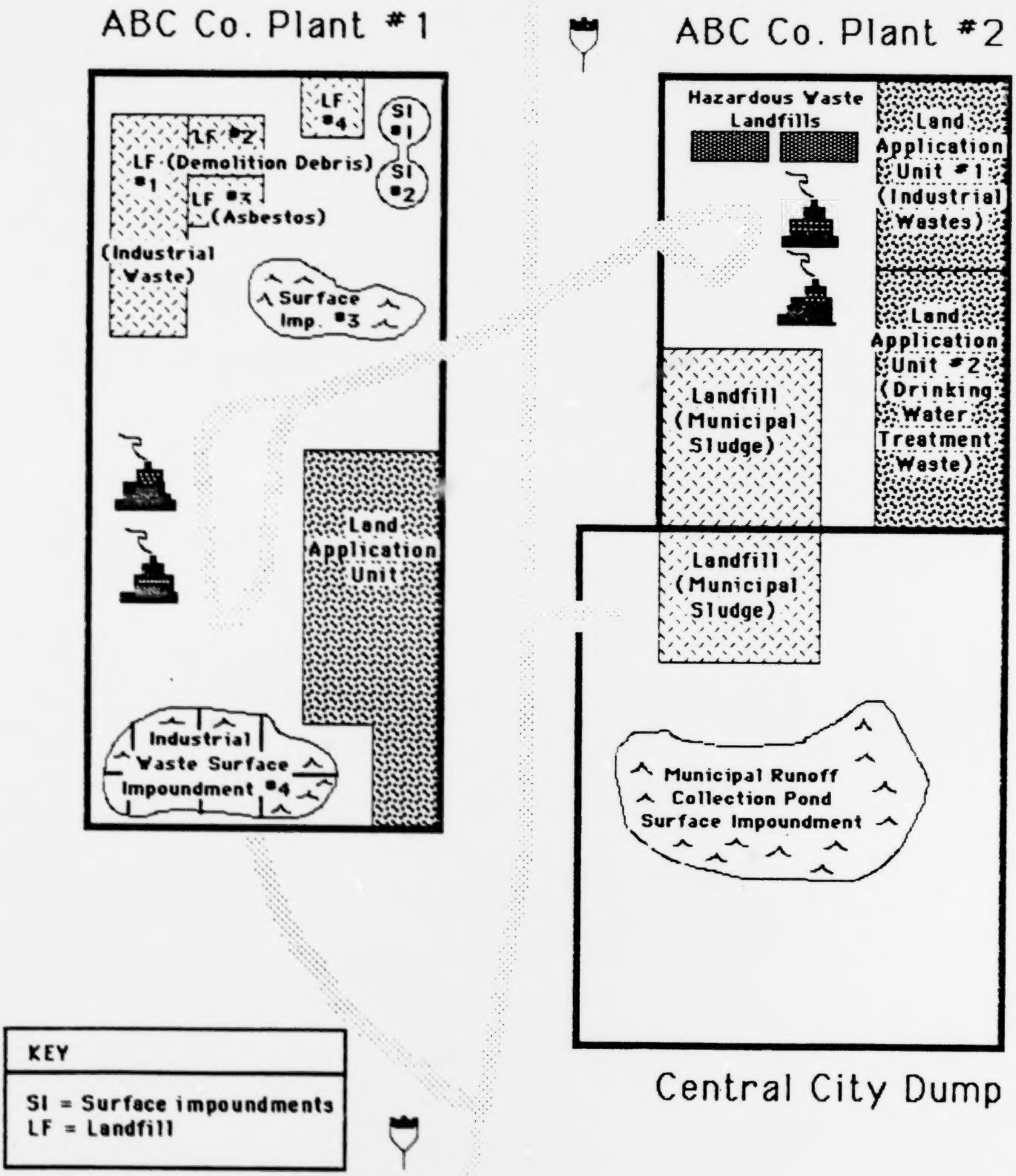
P1. During 1984, how many individual Subtitle D surface impoundments were active in your State? (For the purpose of the questions in Section D, the term "active" means "received waste in 1984.")

NUMBER OF ACTIVE
INDIVIDUAL SUBTITLE D
SURFACE IMPOUNDMENTS IN 1984: 1070 (P)

P2. In the table below, please enter the number of active individual Subtitle D surface impoundments in 1984 in each of the following categories.

Surface impoundment type	Number of active individual Subtitle D surface impoundments in 1984
a. Municipal wastewater.	14
b. Municipal sewage sludge	191 (G)
c. Municipal run-off	160 (F)
d. Industrial waste.	500 (VP)
e. Agricultural waste.	55 (F)
f. Mining waste.	2.0 (P)
g. Oil or gas waste.	0
h. Other e.g., drinking water treatment sludges: (SPECIFY): __________ __________	0
i. TOTAL SHOULD EQUAL RESPONSE TO QUESTION P1:	1070 (P)

DIAGRAM


ABC Co. Plant #1
LF #4
SI #1
SI #2
LF #2
LF (Demolition Debris)
#1
LF #3 (Asbestos)
(Industrial Waste)
Surface Imp. #3
Land Application Unit
Industrial Waste Surface Impoundment #4
ABC Co. Plant #2
Hazardous Waste Landfills
Land Application Unit #1 (Industrial Wastes)
Land Application Unit #2 (Drinking Water Treatment Waste)
Landfill (Municipal Sludge)
Landfill (Municipal Sludge)
Municipal Runoff Collection Pond Surface Impoundment
Central City Dump
KEY
SI = Surface impoundments
LF = Landfill

DEFINITIONS

It is important in this survey to pay strict attention to the definitions provided below. If the definitions appear ambiguous or incomplete, please use the toll-free assistance number given at the back of these General Instructions before filling out this questionnaire, and use the Comments section at the end of each part of the questionnaire to describe the difficulty. A diagram has been provided on the facing page to help clarify the definitions below.

ESTABLISHMENT - A single physical location where business is conducted or where services or industrial operations are performed by a municipality, corporation, or other public or private entity. An establishment may have one or more landfills, land application units, and surface impoundments. [NOTE: The diagram shows three establishments -- (1) ABC Company, Plant #1; (2) ABC Company, Plant #2; and (3) Central City Dump. Plant #1 and Plant #2 are two separate establishments even though they are under the same ownership because they are at two separate (non-contiguous) locations.]

LANDFILL - A part of an establishment at which waste is placed in or on land and which is not a land application unit, a surface impoundment, an injection well, or compost piles. [NOTE: The diagram shows a total of six landfills -- four in Plant #1, one in Plant #2 (the hazardous waste landfills are not counted), and one in the City Dump. The contiguous landfills in Plant #1 are counted separately because they are discrete units with different types of waste. The contiguous landfills of Plant #2 and the City Dump are counted separately because they have different owners.]

Municipal Waste Landfill - A landfill that primarily receives household refuse and commercial waste. It may also receive a limited amount of other types of Subtitle D wastes, such as municipal sewage sludge and industrial wastes.

Industrial Waste Landfill - A landfill that primarily receives waste from factories, processing plants, and other manufacturing activities.

Demolition Debris Landfill - A landfill that receives only construction or demolition debris (e.g., debris from the construction or demolition of bridges, highways, or buildings), brush, stumps and rubble.

Other Landfill - A landfill receiving Subtitle D wastes that does not not fall into any of the above categories (e.g., a landfill that receives only municipal sewage sludge).

LAND APPLICATION UNIT - A part of an establishment at which waste is applied onto or incorporated into the soil surface for the purpose of beneficial use or waste treatment and disposal. Land application is often referred to as landfarming or landspreading. Specifically excluded from this definition are manure spreading operations. [NOTE: The diagram shows three land application units -- one in Plant #1 and two in Plant #2. In Plant #2, the land application units are contiguous but counted separately because they are discrete units with different types of waste.]

Municipal Sewage Sludge Land Application Unit - A land application unit that primarily receives sewage sludge from publicly-owned or privately-owned domestic sewage treatment facilities, including sludge from domestic septic tanks. [NOTE: Do not include municipal wastewater land application units in this category -- these are not included in the scope of this survey.]

- High Application Rate Units - Municipal sewage sludge land application units where the application rate exceeds the nutrient needs of crops. These units may be used for reclamation of disturbed lands, waste treatment or disposal.

- Low Application Rate Units - Municipal sewage sludge land application units where the application rate is based on crop nutrient needs.

Industrial Waste Land Application Unit - A land application unit that primarily receives waste (including sludge or wastewater) from factories, processing plants, and other manufacturing or commercial activities.

Oil or Gas Waste Land Application Unit - A land application unit that receives waste, such as drilling muds, generated by oil or gas exploration and extraction operations.

Other Land Application Unit - A land application unit receiving Subtitle D wastes that does not fall into any of the above categories (e.g., a drinking water treatment waste land application unit).

STATE - Any of the 50 states, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, or the Commonwealth of the Northern Mariana Islands.

SURFACE IMPOUNDMENT - A part of an establishment which is a natural topographic depression, man-made excavation, or diked area formed primarily of earthen materials (although it may be lined with man-made materials) that is designed to hold an accumulation of liquid wastes or wastes containing free liquids. Treatment, storage, and disposal surface impoundments are included. Surface impoundments are often referred to as pits, ponds, or lagoons. This definition does not include any type of tank, including concrete, fiberglass or steel tanks. [NOTE: The diagram shows five surface impoundments -- four in

Plant #1 and one in the City Dump. Although Surface Impoundment #1 and Surface Impoundment #2 are joined, they are counted separately because they are separate depressions. The industrial waste surface impoundment is counted as a single impoundment although it has walls or dikes separating parts of the single depression.]

Municipal Wastewater Surface Impoundment - A publicly owned surface impoundment, commonly known as a sewage lagoon or sewage pond, designed to provide partial or total treatment for domestic sewage or a mixture of domestic and industrial wastewater.

Municipal Sewage Sludge Surface Impoundment - A surface impoundment that receives sewage sludge from publicly-owned or privately-owned domestic sewage treatment establishments.

Municipal Run-off Surface Impoundment - A surface impoundment that is used for the collection of run-off or leachate from municipal waste landfills or municipal waste land application units.

Industrial Waste Surface Impoundment - A surface impoundment that primarily receives wastes from factories, processing plants (including food processing), and other manufacturing or commercial activities. Also included in this category are surface impoundments used for the collection of run-off or leachate from industrial or demolition landfills and industrial land application units.

Agricultural Waste Surface Impoundment - A surface impoundment that only receives waste from agricultural operations, including farming, crop production, and animal husbandry (including feedlots). Specifically excluded from this category are surface impoundments that are used for wastes from slaughter houses, other animal processing, and food processing, which are included in the "industrial" category.

Mining Waste Surface Impoundment - A surface impoundment associated with mineral extraction and beneficiation activities such as crushing, screening, washing, floatation, etc. These minerals include metallic and non-metallic ores, coals, sand and gravel, but *exclude* oil and gas. Specifically excluded are impoundments used for processing wastes from manufacturing establishments which are included in the "industrial" category.

Oil or Gas Waste Surface Impoundment - A surface impoundment that receives waste from oil or gas exploration and extraction, commonly known as brine pits. Both disposal and emergency brine pits are included. Specifically excluded are impoundments used for petroleum refinery wastes, which are included in the "industrial" category.

Other Surface Impoundment - A surface impoundment receiving Subtitle D wastes that does not fall into any of the above categories (e.g., a drinking water treatment waste impoundment).

IF YOU NEED HELP

Westat, Inc., a research firm in Rockville, Maryland, is under contract with EPA to assist in this survey's design and data processing activities. If you should have a question concerning the completion of a specific questionnaire item, you may call their Questionnaire Assistance Center toll-free at (800) 638-8985 and ask for the EPA Subtitle D Specialist. If you have any general questions about the scope or purpose of this survey, please call Mike Flynn, (202) 382-4489, of EPA's Office of Solid Waste.

PLEASE BE SURE TO SIGN THE CERTIFICATION STATEMENT AT THE END OF THE QUESTIONNAIRE.

THANK YOU

U.S. ENVIRONMENTAL PROTECTION AGENCY
STATE SUBTITLE D PROGRAM QUESTIONNAIRE

PART I - STATE ORGANIZATION AND RESOURCES
(Section A)

IMPORTANT: BEFORE PROCEEDING WITH THIS QUESTIONNAIRE, READ THE GENERAL INSTRUCTIONS PAMPHLET CAREFULLY INCLUDING THE DEFINITIONS.

A. STATE ORGANIZATION AND RESOURCES

The objective of this section is to construct a directory of the agencies in your State that are responsible for administering Subtitle D waste management programs, and to determine their level of funding and program emphasis.

A1. In Column A, list all of the agencies with separate budgets in this State that are responsible for developing, regulating, enforcing, overseeing, and otherwise administering any part of the Subtitle D program. In Column B below, enter the total dollar amount budgeted for each agency for Subtitle D related work for the fiscal year (FY) ending in 1984. In Column C, please estimate the total number of person hours that the agency expended on work directly related to Subtitle D establishments, issues and activities during the FY ending in 1984. In Columns D through K, please estimate the percent of total hours that were expended in each of the listed activities during the FY ending in 1984. If you are unable to estimate the distribution of hours across activities for an agency, put a check (✓) on the % line for each of the agency's activities. [DO NOT INCLUDE VACATION, HOLIDAY AND SICK LEAVE HOURS IN COLUMN C. COLUMN C SHOULD ONLY INCLUDE HOURS WORKED]

AGENCY #	A. State agency with separate budget	B. Total Budget for Subtitle D work the FY ending in 1984	C. Total hours worked on Subtitle D during the FY ending in 1984	D.	E.
				Percent of	
				Planning	Regulation Development
1	Agency: ________ Contact Name: ________ Phone No: ________	($)	(hours)	(%)	(%)
2	Agency: ________ Contact Name: ________ Phone No: ________	($)	(hours)	(%)	(%)
3	Agency: ________ Contact Name: ________ Phone No: ________	($)	(hours)	(%)	(%)
4	Agency: ________ Contact Name: ________ Phone No: ________	($)	(hours)	(%)	(%)

IF ADDITIONAL AGENCIES ARE INVOLVED IN THE STATE SUBTITLE D PROGRAM, CHECK THIS BOX ☐ AND ATTACH ADDITIONAL SHEETS.

Subtitle D program includes:

- Landfills
  - municipal waste
  - industrial waste
  - demolition debris
  - other Subtitle D landfill wastes
- Land Application Units
  - municipal sewage sludge
  - industrial waste
  - oil or gas waste
  - other Subtitle D land application wastes
- Surface Impoundments
  - municipal wastewater
  - municipal sewage sludge
  - municipal run-off
  - industrial waste
  - agricultural waste
  - mining waste
  - oil or gas waste
  - other Subtitle D surface impoundment wastes

F.	G.	H.	I.	J.	K.	L.
Total Subtitle D Hours in Each Activity						Total percent (columns D-K should equal 100%)
Surveillance and Enforcement	Training Given	Research	Permitting or Licensing	Technical Assistance	Other [SPECIFY]: ____________ ____________	
________ (%)	________ (%)	________ (%)	________ (%)	________ (%)	________ (%)	100% (%)
________ (%)	________ (%)	________ (%)	________ (%)	________ (%)	________ (%)	100% (%)
________ (%)	________ (%)	________ (%)	________ (%)	________ (%)	________ (%)	100% (%)
________ (%)	________ (%)	________ (%)	________ (%)	________ (%)	________ (%)	100% (%)

A2. Please indicate below how your State defines the fiscal year ending in 1984.

a. Fiscal year ending in 1984: ________ (month), ________ (year) through ________ (month), 1984 (year).

A3. Using the agency numbers from question A1 above, please indicate which agency or agencies have the following responsibilities. If the responsibility is not assigned to any particular agency indicate by circling NA. [CIRCLE ALL APPLICABLE AGENCY NUMBERS]

Responsibility	Agency Number(s)				
LANDFILLS:					
a. Subtitle D municipal waste landfills	1	2	3	4	NA
b. Subtitle D industrial waste landfills	1	2	3	4	NA
c. Subtitle D demolition debris landfills	1	2	3	4	NA
d. All other types of Subtitle D landfills (such as drinking water treatment waste landfills, or any other landfills not included in a, b and c above)	1	2	3	4	NA
LAND APPLICATION:					
e. Subtitle D municipal sewage sludge land application units	1	2	3	4	NA
f. Subtitle D industrial waste land application units	1	2	3	4	NA
g. Subtitle D oil or gas waste land application units	1	2	3	4	NA
h. All other types of Subtitle D land application units (such as drinking water treatment waste land application units, or any other land application units not included in e, f, and g above)	1	2	3	4	NA

Responsibility	Agency Number(s)
SURFACE IMPOUNDMENTS:	
i. Subtitle D municipal wastewater surface impoundments.	1 2 3 4 NA
j. Subtitle D municipal sewage sludge surface impoundments	1 2 3 4 NA
k. Subtitle D municipal run-off surface impoundments	1 2 3 4 NA
l. Subtitle D industrial waste surface impoundments.	1 2 3 4 NA
m. Subtitle D agricultural waste surface impoundments.	1 2 3 4 NA
n. Subtitle D mining waste surface impoundments.	1 2 3 4 NA
o. Subtitle D oil or gas waste surface impoundments.	1 2 3 4 NA
p. All other types of Subtitle D surface impoundments (such as drinking water treatment waste surface impoundments not included in i through o above)	1 2 3 4 NA

A4. What percentage of your State's total Subtitle D budget for fiscal years ending in 1984 and 1985 came from the following sources: [ENTER THE PERCENTAGE RECEIVED FROM EACH FUNDING SOURCE FOR EACH YEAR. THE TOTAL OF THE PERCENTAGES FOR EACH YEAR SHOULD EQUAL 100%]

Funding source	Fiscal year ending in 1984	Fiscal year ending in 1985
a. State sources	________%	________%
b. Federal sources (please include any Subtitle D related funding for water programs)	________%	________%
c. License or user fees.	________%	________%
d. Other [SPECIFY]: ____________________ ________________________________ ________________________________ ________________________________ ________________________________	________%	________%
TOTAL OF LINES a, b, c AND d FOR EACH FISCAL YEAR SHOULD EQUAL 100%:	100%	100%

A5. Are funds from any other programs used to support Subtitle D program activities? [CIRCLE ONLY ONE CODE]

Yes [GO ON TO QUESTION A6]. 1
No [SKIP TO QUESTION A7]. 2

A6. Please list the other program or programs from which funds are obtained to support Subtitle D activities:

A7. Please indicate the areas in which Subtitle D program effectiveness would be most improved by additional resources, by ranking each of the areas listed below 1 through 7 according to the expected improvement in effectiveness. Use the rank "1" for the area that would show the greatest improvement, "2" for the area that would show the next greatest improvement, "7" for the area that would show the least improvement, etc. (The areas listed below are the same areas that were listed in question A1.)

	Rank each area "1" (for greatest improvement) through "7" (for least improvement) [USE EACH NUMBER, 1 THROUGH 7 ONCE FOR EACH PROCESS TYPE]*		
	Landfills	Land Application Units	Surface Impoundments
a. Planning..................			
b. Regulation Development.....			
c. Surveillance and Enforcement................			
d. Training Given............			
e. Research..................			
f. Permitting or Licensing....			
g. Technical assistance.......			
h. Other [SPECIFY]*:			

*IF YOU USE "H Other [SPECIFY]:", PLEASE RANK THE ITEMS ON A SCALE OF 1-8.

A8. For those areas you ranked "1" and "2" in question A7, please indicate how you would use the additional resources to improve Subtitle D program effectiveness. [* A LIST OF SUBTITLE D PROCESS TYPES IS INCLUDED IN QUESTION A3, AND THE DEFINITIONS OF THESE SUBTITLE D PROCESSES MAY BE FOUND IN THE GENERAL INSTRUCTIONS]

USE OF ADDITIONAL RESOURCES FOR AREAS RANKED "1" IN QUESTION A7:

LANDFILLS ("1"): ______________________________

____

LAND APPLICATION UNITS ("1"): ______________________________

____

SURFACE IMPOUNDMENTS ("1"): ______________________________

____

USE OF ADDITIONAL RESOURCES FOR AREAS RANKED "2" IN QUESTION A7:

LANDFILLS ("2"): ______________________________

____

LAND APPLICATION UNITS ("2"): ______________________________

____

SURFACE IMPOUNDMENTS ("2"): ______________________________

____

A9. How many establishments in your State had active Subtitle D processes (landfills, land application units, and/or surface impoundments) in 1984? (For the purpose of this questionnaire, "active" means "received waste during 1984" and "1984" refers to the calendar year 1984. An "establishment" is a single physical location where business is conducted or where services or industrial operations are performed by a municipality, corporation, or other public or private entity. An establishment may have one or more landfills, land application units, and surface impoundments. An example and explanatory diagram is included in the General Instructions.)

NUMBER OF ESTABLISHMENTS WITH
ACTIVE SUBTITLE D PROCESSES IN 1984: ______________

A10. Please estimate the number of establishments that only had inactive or closed Subtitle D landfills, land application units, and or surface impoundments in 1984 in your State.

NUMBER OF ESTABLISHMENTS WITH
ONLY INACTIVE OR CLOSED
SUBTITLE D PROCESSES IN 1984: ____________________

A11. Please identify a contact person for this section of the survey, should it be necessary to clarify responses:

Contact Name: ____________________

Title: ____________________

Agency/Program: ____________________

Telephone: (   ) ____________________ Ext.: ____________

A12. COMMENTS - Please include any comments or further amplification of responses to this section below or on attached sheets.

U.S. ENVIRONMENTAL PROTECTION AGENCY
STATE SUBTITLE D PROGRAM QUESTIONNAIRE

PART II - LANDFILLS
(Sections B-G)

IMPORTANT: BEFORE PROCEEDING WITH THIS SECTION, READ THE GENERAL INSTRUCTIONS AT THE FRONT OF THIS QUESTIONNAIRE CAREFULLY. PLEASE PAY SPECIAL ATTENTION TO THE DEFINITIONS BELOW.

LANDFILL - A part of an establishment at which waste is placed in or on land and which is not a land application unit, a surface impoundment, an injection well, or compost pile.

Municipal Waste Landfill - A landfill that primarily receives household refuse and commercial waste. It may also receive a limited amount of other types of Subtitle D wastes, such as municipal sewage sludge and industrial wastes.

Industrial Waste Landfill - A landfill that primarily receives waste from factories, processing plants, and other manufacturing activities.

Demolition Debris Landfill - A landfill that receives only construction or demolition debris (e.g., debris from the construction of or demolition of bridges, highways, or buildings), brush, stumps and rubble.

Other Landfill - A landfill receiving Subtitle D wastes that does not fall into any of the above categories (e.g., a landfill that receives only municipal sewage sludge).

B. SUBTITLE D LANDFILL REGULATIONS

The objective of this section is to gather current information on existing and proposed State regulations and permits.

B1. The table below presents a list of specific requirements for Subtitle D landfills. For each column A through D, circle code 1 if these requirements are specifically included in the State regulations. Circle code 2 if these requirements are not specifically included in the State regulations, but can be enforced under general performance standards or State policies. Circle code 3 if there are no enforceable requirements. [FOR EACH REQUIREMENT, PLEASE CIRCLE ONLY ONE CODE FOR EACH LANDFILL TYPE]

Requirements included in current State Subtitle D program?	Landfill					
	A. Municipal waste			B. Industrial waste		
	Specifically included in the regulations	Enforced under general standards and policies	No enforceable requirements	Specifically included in the regulations	Enforced under general standards and policies	No enforceable requirements
a. Natural (e.g., clay) liners	1	2	3	1	2	3
b. Synthetic liners	1	2	3	1	2	3
c. Location standards (e.g., floodplains)	1	2	3	1	2	3
d. Leachate collection and removal	1	2	3	1	2	3
e. Leachate characterization/ analysis	1	2	3	1	2	3
f. Leachate treatment	1	2	3	1	2	3
g. Groundwater protection standard	1	2	3	1	2	3
h. Groundwater monitoring	1	2	3	1	2	3
i. Corrective action for groundwater contamination	1	2	3	1	2	3
j. Air protection standard	1	2	3	1	2	3
k. Air emissions monitoring	1	2	3	1	2	3
l. Methane monitoring	1	2	3	1	2	3
m. Methane controls	1	2	3	1	2	3
n. Corrective action for off-site methane migration	1	2	3	1	2	3
o. Surface water protection standards	1	2	3	1	2	3
p. Surface water monitoring	1	2	3	1	2	3
q. Corrective action for surface water contamination	1	2	3	1	2	3
r. Run-off collection and removal	1	2	3	1	2	3
s. Run-off characterization/ analysis	1	2	3	1	2	3
t. Run-off treatment	1	2	3	1	2	3
u. Run-on controls	1	2	3	1	2	3
v. Restrictions on receipt of liquid waste	1	2	3	1	2	3
w. Restrictions on types of Subtitle D wastes received	1	2	3	1	2	3
x. Daily cover	1	2	3	1	2	3
y. Endangered species criteria	1	2	3	1	2	3
z. Disease vectors criteria	1	2	3	1	2	3
aa. Safety criteria: Bird hazards	1	2	3	1	2	3
bb. Safety criteria: Uncontrolled access	1	2	3	1	2	3
cc. Closure standards (e.g., caps)	1	2	3	1	2	3
dd. Postclosure monitoring	1	2	3	1	2	3
ee. Financial responsibility	1	2	3	1	2	3

IMPORTANT: SEE DEFINITION OF LANDFILL TYPE ON PAGE II-1.

Types					
C. Demolition debris only			D. Other [SPECIFY]: __________ __________ __________		
Specifically included in the regulations	Enforced under general standards and policies	No enforceable requirements	Specifically included in the regulations	Enforced under general standards and policies	No enforceable requirements
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3

B2. Please indicate for each landfill type whether the following specific requirements are included in formally proposed State regulations. [IF THERE ARE NO FORMALLY PROPOSED REGULATIONS IN YOUR STATE, PLEASE PLACE A CHECK IN THE BOX: ☐ AND SKIP TO B3.]

Specific requirements included in formally proposed regulations?	Landfill Types							
	A. Municipal waste		B. Industrial waste		C. Demolition debris		D. Other [SPECIFY]: ____ ____ ____	
	Yes	No	Yes	No	Yes	No	Yes	No
a. Natural (e.g., clay) liners	1	2	1	2	1	2	1	2
b. Synthetic liners	1	2	1	2	1	2	1	2
c. Location standards (e.g., floodplains)	1	2	1	2	1	2	1	2
d. Leachate collection and removal	1	2	1	2	1	2	1	2
e. Leachate characterization/analysis	1	2	1	2	1	2	1	2
f. Leachate treatment	1	2	1	2	1	2	1	2
g. Groundwater protection standard	1	2	1	2	1	2	1	2
h. Groundwater monitoring	1	2	1	2	1	2	1	2
i. Corrective action for groundwater contamination	1	2	1	2	1	2	1	2
j. Air protection standard	1	2	1	2	1	2	1	2
k. Air emissions monitoring	1	2	1	2	1	2	1	2
l. Methane monitoring	1	2	1	2	1	2	1	2
m. Methane controls	1	2	1	2	1	2	1	2
n. Corrective action for off-site methane migration	1	2	1	2	1	2	1	2
o. Surface water protection standards	1	2	1	2	1	2	1	2
p. Surface water monitoring	1	2	1	2	1	2	1	2
q. Corrective action for surface water contamination	1	2	1	2	1	2	1	2
r. Run-off collection and removal								
s. Run-off characterization/analysis	1	2	1	2	1	2	1	2
t. Run-off treatment	1	2	1	2	1	2	1	2
u. Run-on controls	1	2	1	2	1	2	1	2
v. Restrictions on receipt of liquid waste	1	2	1	2	1	2	1	2
w. Restrictions on types of Subtitle D wastes received	1	2	1	2	1	2	1	2
x. Daily cover	1	2	1	2	1	2	1	2
y. Endangered species criteria	1	2	1	2	1	2	1	2
z. Disease vectors criteria	1	2	1	2	1	2	1	2
aa. Safety criteria: Bird hazards	1	2	1	2	1	2	1	2
bb. Safety criteria: Uncontrolled access	1	2	1	2	1	2	1	2
cc. Closure standards (e.g., caps)	1	2	1	2	1	2	1	2
dd. Postclosure monitoring	1	2	1	2	1	2	1	2
ee. Financial responsibility	1	2	1	2	1	2	1	2

B3. In the table below, indicate whether your State currently requires permits, plan approval or licenses/registration for each of the listed types of Subtitle D landfills. [PLEASE CIRCLE EITHER "1" OR "2" FOR EACH TYPE OF LANDFILL FOR BOTH PERMITS AND LICENSES.]

Landfill type	A. Permit or plan approval required?		B. License or registration required?	
	Yes	No	Yes	No
a. Municipal waste.	1	2	1	2
b. Industrial waste	1	2	1	2
c. Demolition debris only	1	2	1	2
d. Other [SPECIFY]: ____________________ ______________________________	1	2	1	2

COMMENTS: [PLEASE EXPLAIN IF PERMIT REQUIREMENTS VARY WITHIN ANY OF THE ABOVE CATEGORIES, E.G. - SOME INDUSTRIAL WASTE LANDFILLS REQUIRE PERMITS AND OTHERS DON'T]

____

____

____

B4. How many of the active individual Subtitle D landfills of each type in your State currently have permits/approved plans, or licenses/registrations?

Landfill type	Number of individual Subtitle D landfills that have permits or approved plans	Number of individual Subtitle D landfills licensed or registered
a. Municipal waste.	________	________
b. Industrial waste	________	________
c. Demolition debris only	________	________
d. Other (SPECIFY): ________________ ______________________________	________	________

B5. Is there a written or published schedule of your State's permit fees for Subtitle D landfills? [CIRCLE ONLY ONE CODE]

Yes [PLEASE ATTACH A COPY OF THE
FEE SCHEDULE TO THE BACK OF
THIS QUESTIONNAIRE] 1
No. 2
N/A (THERE ARE NO LANDFILL PERMIT
FEES IN MY STATE) 3

B6. Please attach a copy of your State's Subtitle D landfill regulations (existing and proposed, if any) to the back of this questionnaire.

IMPORTANT NOTE: 1984 REFERS TO CALENDAR YEAR 1984 THROUGHOUT THE REMAINING QUESTIONNAIRE.

C. ENFORCEMENT OF LANDFILL REGULATIONS

C1. How many inspections for compliance with State Subtitle D regulations were made during 1984 for each type of landfill listed below? [COUNT INDIVIDUAL INSPECTIONS, E.G., IF YOU HAD 100 LANDFILLS AND EACH WAS INSPECTED TWICE DURING CALENDAR YEAR 1984, YOUR NUMBER OF INSPECTIONS WOULD BE 200]

Landfill type	Number of inspections during 1984
a. Municipal waste.	________
b. Industrial waste	________
c. Demolition debris only	________
d. Other (SPECIFY): ________________________________ ________________________________	________
e. TOTAL NUMBER OF INSPECTIONS DURING 1984.	

C2. How frequently are individual Subtitle D landfills inspected for compliance? [ENTER THE PERCENTAGE OF LANDFILLS FALLING IN EACH FREQUENCY OF INSPECTION CATEGORY]

Landfill type	Frequency of Inspection								
	A. Never Inspected	B. Less than once every two years	C. Once every two years	D. Once a year	E. Twice a year	F. Four times a year	G. More than four times a year	H. Other [SPECIFY FOR EACH TYPE]:	I. Total [SHOULD EQUAL 100%]
a. Municipal waste	___%	___%	___%	___%	___%	___%	___%	________%	100%
b. Industrial waste	___%	___%	___%	___%	___%	___%	___%	________%	100%
c. Demolition debris only	___%	___%	___%	___%	___%	___%	___%	________%	100%
d. Other [SPECIFY]: ____________ ____________	___%	___%	___%	___%	___%	___%	___%	________%	100%

C3. Do you have a checklist of criteria for inspections? [CIRCLE ONLY ONE CODE]

Yes [PLEASE ATTACH A COPY OF THE
CHECKLIST TO THE BACK OF
THIS QUESTIONNAIRE] 1
No. 2

C4. In the table below, please describe the number and types of violations that were found by your State's 1984 landfill inspection program. In Columns A through D, report the number of individual Subtitle D landfills that had at least one violation of the types listed below.

Violation type	Number of individual Subtitle D landfills (by type) in violation in 1984:			
	A. Municipal waste	B. Industrial waste	C. Demolition debris only	D. Other [SPECIFY]: ____________ ____________
a. Groundwater contamination*.........				
b. Groundwater monitoring program deficiencies...............				
c. Surface water contamination*.......				
d. Air contamination*.................				
e. Methane control deficiencies.......				
f. Operational deficiencies (e.g., daily cover violation, or blowing litter) and other minor violations...................				
g. Other violations in 1984 [SPECIFY]: ______________________ ______________________ ______________________				

*[PLEASE USE THAT DEFINITION OF CONTAMINATION THAT BEST APPLIES TO YOUR STATE WHEN ANSWERING THIS QUESTION, I.E., THE DEFINITION USED IN YOUR STATE (E.G., IN REGS, ETC.)].

D. THE NUMBER OF ACTIVE INDIVIDUAL SUBTITLE D LANDFILLS AND THE NUMBER OF ESTABLISHMENTS WITH ACTIVE LANDFILLS

The objective of this section is to obtain information on the number of active individual Subtitle D landfills (both permitted and unpermitted), and the number of establishments with Subtitle D landfills. [SEE GENERAL INSTRUCTIONS FOR A DIAGRAM AND DEFINITIONS OF LANDFILL AND ESTABLISHMENT]

D1. During 1984, how many individual Subtitle D landfills were active in your State? (For the purpose of the questions in Section D, the term "active" means "received waste in 1984.")

NUMBER OF ACTIVE INDIVIDUAL SUBTITLE D LANDFILLS IN 1984: ____________________

D2. In the table below, please enter the number of active individual Subtitle D landfills in 1984 in each of the following categories.

Landfill type	Number of active individual Subtitle D landfills in 1984
a. Municipal waste	
b. Industrial waste.	
c. Demolition debris only.	
d. Other [SPECIFY]: ______________________________ ______________________________	
e. TOTAL SHOULD EQUAL RESPONSE TO QUESTION D1:	

D3. How many establishments in your State had active Subtitle D landfills in 1984? (An establishment is defined as a single physical location where business is conducted or where services or industrial operations are performed by a municipality, corporation, or other public or private entity. An establishment may have two or more landfills).

NUMBER OF ESTABLISHMENTS WITH ACTIVE SUBTITLE D LANDFILLS IN 1984: ______________

D4. In the table below, please enter the number of individual active Subtitle D landfills in 1984 (by landfill type) in each of the ownership categories listed.

Landfill type	Number of individual active Subtitle D landfills					
	A. Owned by State government	B. Owned by local governments	C. Owned by Federal government	D. Privately owned	E. Other*	F. Total number of landfills by type [THIS SHOULD EQUAL THE NUMBER IN D2]
a. Municipal waste.........						
b. Industrial waste.........						
c. Demolition debris only...						
d. Other [SPECIFY]: ______ ______ ______						

* [SPECIFY "OTHER" OWNERSHIP CATEGORY, IF USED]: ______________________________

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E. LANDFILL DESIGN AND OPERATING CHARACTERISTICS

The objective of this section is to determine the design and operating characteristics of Subtitle D landfills.

E1. In the table below, please enter the number of active individual Subtitle D landfills in 1984 (by landfill type) in each of the landfill acreage categories listed. (Acreage should include active, inactive, and closed portions of each landfill. Column D totals should equal the distribution of individual landfills in Question D2.)

Landfill type	Number of active individual Subtitle D landfills with:			
	A. Less than 10 acres	B. 10 - 100 acres	C. More than 100 acres	D. Total number of landfills by type
a. Municipal waste......................				
b. Industrial waste.....................				
c. Demolition debris only...............				
d. Other [SPECIFY]: ____________________ ____________________				
e. TOTAL NUMBER OF LANDFILLS BY ACREAGE CATEGORY..................				

E2. In the table below, please enter the number of active individual Subtitle D landfills (by landfill type) according to the amount of waste received in 1984. Column D Totals should equal the number of landfills in question D2. (Note: Assume 500 pounds per cubic yard of waste as received if units conversion is necessary.)

Landfill type	Number of active individual Subtitle D landfills by amount of waste received in 1984:			
	A. Received less than 30,000 cubic yards in 1984 (30 tons per day)	B. Received 30,000 - 600,000 cubic yards in 1984 (30-500 tons per day)	C. Received more than 600,000 cubic yards in 1984 (500 tons per day)	D. Total number of landfills by type [THIS SHOULD EQUAL THE NUMBER IN D2]
a. Municipal waste.............				
b. Industrial waste............				
c. Demolition debris only......				
d. Other [SPECIFY]: __________________ __________________				
e. TOTAL NUMBER OF LANDFILLS BY CATEGORY				

E3. Please describe any local, regional or statewide landfill capacity problems in your State. [ATTACH ADDITIONAL SHEETS IF NECESSARY]

E4. In the table below, please enter the number of active individual Subtitle D landfills (by landfill type) that had groundwater, surface water, air and methane monitoring in 1984.

Landfill type	Number of active individual Subtitle D landfills that had:			
	A. Groundwater Monitoring	B. Surface Water Monitoring	C. Air Emissions Monitoring	D. Methane Monitoring
a. Municipal waste........................				
b. Industrial waste......................				
c. Demolition debris only.................				
d. Other [SPECIFY]:				
e. TOTAL NUMBER OF LANDFILLS WITH EACH TYPE OF MONITORING:				

E5. In the table below, please estimate the number of active individual Subtitle D landfills (by landfill type) that had or used the following release prevention/management methods in 1984:

Management method	Number of active individual Subtitle D landfills:			
	A. Municipal waste	B. Industrial wastes	C. Demolition debris only	D. Other [SPECIFY]: ________ ________ ________
a. Synthetic liners				
b. Natural liners (e.g., clay), including slurry walls				
c. Natural renovation (i.e., leachate attenuation).				
d. Leachate collection systems				
e. Leachate treatment (except leachate recirculation)				
f. Leachate recirculation				
g. Run-on/run-off controls.				
h. Methane controls (vents, recovery).				
i. Restrictions on receipt of liquid wastes (e.g., bulk liquid restrictions)				

E6. Certain non-household hazardous wastes are exempted from Federal and some State hazardous waste regulations if generated in small quantities. Please indicate the percentage of Subtitle D landfills of each type that receive such wastes?

Landfill type	Percent that receive exempted non-household hazardous wastes.
a. Municipal waste.	____________%
b. Industrial waste	____________%
c. Demolition debris only	____________%
d. Other [SPECIFY]: ______________________________ ______________________________________	____________%

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E7. What is the typical State-wide tipping fee (i.e., fee or charge levied on disposers, transporters, or collectors bringing Subtitle D waste to a landfill) to landfill customers for disposal of sludges and other solid waste at each of the following types of Subtitle D landfills? [ENTER TYPICAL TIPPING FEES AND CIRCLE THE UNIT CODE AT THE BOTTOM OF THE TABLE]*

Landfill type	Sludges		Other Solid Waste	
	Typical tipping fees	Range	Typical tipping fees	Range
a. Municipal waste. . .	$ ______	$ ____ to $ ____	$ ______	$ ____ to $ ____
b. Industrial wastes. .	$ ______	$ ____ to $ ____	$ ______	$ ____ to $ ____
c. Demolition debris only	$ ______	$ ____ to $ ____	$ ______	$ ____ to $ ____
d. Other [SPECIFY]: ______ ______	$ ______	$ ____ to $ ____	$ ______	$ ____ to $ ____

Sludges	Other Solid Waste
[CIRCLE ONE]: Per ton . . . . 01 Per cubic yard. . . . . 02 Other [SPECIFY]: ______ ______ ______ 03	[CIRCLE ONE]: Per ton . . . . 01 Per cubic yard. . . . . 02 Other [SPECIFY]: ______ ______ ______ 03

*[IF THIS QUESTION IS NOT APPLICABLE TO YOUR STATE, PLEASE PLACE A CHECK (✓) IN THE BOX: ☐ AND EXPLAIN WHY BELOW, (E.G., "THERE ARE NO TIPPING FEES IN MY STATE," "FEES ARE CHARGED BY LOCAL GOVERNMENTS AND STATE DOES NOT MONITOR")]

______

______

______

F. AVAILABILITY OF DATA

F1. In the table below, please estimate the proportion of individual Subtitle D landfills (by landfill type) for which your State has each type of monitoring data available:

Landfill type	A. Groundwater monitoring data available for: [CIRCLE ONE CODE FOR EACH LANDFILL TYPE]			B. Surface water monitoring data available for: [CIRCLE ONE CODE FOR EACH LANDFILL TYPE]			C. Leachate characterization data available for [CIRCLE ONE CODE FOR EACH LANDFILL TYPE]		
	None (0%)	Some (1-50%)	Most (>50%)	None (0%)	Some (1-50%)	Most (>50%)	None (0%)	Some (1-50%)	Most (>50%)
a. Municipal waste	1	2	3	1	2	3	1	2	3
b. Industrial waste	1	2	3	1	2	3	1	2	3
c. Demolition debris only	1	2	3	1	2	3	1	2	3
d. Other [SPECIFY]: ________ ________ ________	1	2	3	1	2	3	1	2	3

D. Air emission monitoring data available for: [CIRCLE ONE CODE FOR EACH LANDFILL TYPE]			E. Methane monitoring data available for: [CIRCLE ONE CODE FOR EACH LANDFILL TYPE]		
None (0%)	Some (1-50%)	Most (>50%)	None (0%)	Some (1-50%)	Most (>50%)
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3

F2. Please estimate the number of individual Subtitle D landfills (by landfill type) for which your State has case studies. (Case studies include monitoring data, but in addition include a sufficient level of detail on site design and operating practices to provide some indication of the causes for the success or failure of the landfill to protect human health and the environment. Some case studies may also include information on design and operating costs of the landfill and tipping fees.)

[IF YOU ARE NOT AWARE OF ANY CASE STUDIES OF SUBTITLE D LANDFILLS IN YOUR STATE, PLEASE PLACE A CHECK (✓) IN THE BOX: ☐, AND SKIP TO QUESTION F4.]

Landfill type	Number of individual Subtitle D landfills		
	A. With case studies	B. With case studies that include design and operating costs	C. With case studies that include tipping fees
a. Municipal waste...........	____	____	____
b. Industrial waste..........	____	____	____
c. Demolition debris only....	____	____	____
d. Other [SPECIFY]: ____ ____	____	____	____

F3. List any alternate sources of case study information that you know of in your State (e.g., local governments that have case study data).

SOURCE:	CONTACT PERSON	(AREA CODE) TELEPHONE
____	____	( ) ____
____	____	( ) ____
____	____	( ) ____

F4. Does your State already have a list (or file) of establishments with Subtitle D landfills?

Yes [GO ON TO QUESTION F5]. 1
No [SKIP TO QUESTION G1]. 2

F5. In what format is(are) the list(s)? [EXAMPLES: ON A COMPUTER FILE, IN A CARD FILE, ON A WORD PROCESSING DISK, ETC.]

F6. What does(do) the list(s) cover? [EXAMPLES: PERMITTED LANDFILLS ONLY, INDUSTRIAL LANDFILLS ONLY, ALL TYPES OF LANDFILLS THAT ARE LARGER THAN ONE ACRE, ETC.]

F7. If possible, please attach copies of any list(s) to this completed questionnaire. If this is not possible, please indicate below how EPA could obtain a list of landfills in your State.

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G. CONTACT INFORMATION AND COMMENTS AND ATTACHMENTS: LANDFILLS

G1. Please identify a contact person for this landfills section of the survey, should it be necessary to clarify responses:

Contact Name: ______________________________

Title: ______________________________

Agency/Program: ______________________________

Telephone: (   ) ______________________ Ext.: __________

G2. COMMENTS - Please include any comments or further amplification of responses to Sections B through F below or on attached sheets.

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G3. CHECKLIST OF ATTACHMENTS TO PART II - LANDFILLS:
[Please check ✓ the appropriate box if you have attached the following]:

a. Schedule of State permit fees (Question B5) . . . . ☐
b. State Subtitle D landfill regulations (Question B6) . . . . ☐
c. Checklist of State critieria for inspections (Question C3). . . . . . . ☐
d. List of establishments with Subtitle D landfills (Question F7). . . . . ☐
e. Attached comment sheets (Question G2) . . . . ☐

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U.S. ENVIRONMENTAL PROTECTION AGENCY
STATE SUBTITLE D PROGRAM QUESTIONNAIRE

PART III - LAND APPLICATION UNITS
(Sections H-M)

IMPORTANT: BEFORE PROCEEDING WITH THIS SECTION, READ THE GENERAL INSTRUCTIONS AT THE FRONT OF THIS QUESTIONNAIRE CAREFULLY. PLEASE PAY SPECIAL ATTENTION TO THE DEFINITIONS BELOW.

LAND APPLICATION UNIT - A part of an establishment at which waste is applied onto or incorporated into the soil surface for the purpose of beneficial use or waste treatment and disposal. Land application is often referred to as landfarming or landspreading. Specifically excluded from this definition are manure spreading operations.

Municipal Sewage Sludge Land Application Unit - A land application unit that primarily receives sewage sludge from publicily-owned or privately-owned domestic sewage treatment facilities, including sludge from domestic septic tanks. (Note: do not include municipal wastewater land application units in this category - these are not included in the scope of this survey).

High application rate units - Municipal sewage sludge land application units where the application rate exceeds the nutrient needs of crops, for reclamation of disturbed lands, waste treatment or disposal.

Low application rate units - Municipal sewage sludge land application units where the application rate is based on crop nutrient needs.

Industrial Waste Land Application Unit - A land application unit that primarily receives waste (including sludge or wastewater) from factories, processing plants, and other manufacturing or commercial activities.

Oil or Gas Waste Land Application Unit - A land application unit that receives waste, such as drilling muds, generated by oil or gas exploration and extraction operations.

Other Land Application Unit - A land application unit receiving Subtitle D wastes that does not fall into any of the above categories (e.g., a drinking water treatment waste land application unit).

H. SUBTITLE D LAND APPLICATION UNIT REGULATIONS

The objective of this section is to gather current information on existing and proposed State regulations and permits.

H1. The table below presents a list of specific requirements for Subtitle D land application units. For each column A through E, circle code 1 if these requirements are specifically included in the State regulations. Circle code 2 if these requirements are not specifically included in the State regulations, but can be enforced under general performance standards or State policies. Circle code 3 if there are no enforceable requirements. [FOR EACH REQUIREMENT, PLEASE CIRCLE ONLY ONE CODE FOR EACH LAND APPLICATION UNIT TYPE]

Requirements included in current State Subtitle D program?	Land Application					
	A. Municipal sewage sludge at high application rate*			B. Municipal sewage sludge at low application rate*		
	Specifically included in the regulations	Enforced under general standards and policies	No enforceable requirements	Specifically included in the regulations	Enforced under general standards and policies	No enforceable requirements
a. Location standards (e.g., floodplains	1	2	3	1	2	3
b. Waste application limits	1	2	3	1	2	3
c. Restrictions on growing food chain crops	1	2	3	1	2	3
d. Restrictions on types of Subtitle D wastes received	1	2	3	1	2	3
e. Sludge quality criteria	1	2	3	1	2	3
f. Waste disinfection prior to application	1	2	3	1	2	3
g. Soil monitoring	1	2	3	1	2	3
h. Groundwater protection standard	1	2	3	1	2	3
i. Groundwater monitoring	1	2	3	1	2	3
j. Corrective action for groundwater contamination	1	2	3	1	2	3
k. Air emission monitoring	1	2	3	1	2	3
l. Air protection standards	1	2	3	1	2	3
m. Surface water protection standards	1	2	3	1	2	3
n. Surface water monitoring	1	2	3	1	2	3
o. Corrective action for surface water contamination	1	2	3	1	2	3
p. Run-off collection and removal	1	2	3	1	2	3
q. Run-off characterization/analysis	1	2	3	1	2	3
r. Run-off treatment	1	2	3	1	2	3
s. Run-on controls	1	2	3	1	2	3
t. Endangered species criteria	1	2	3	1	2	3
u. Disease vectors criteria	1	2	3	1	2	3
v. Safety criteria: Uncontrolled access	1	2	3	1	2	3
w. Closure standards	1	2	3	1	2	3
x. Postclosure monitoring	1	2	3	1	2	3
y. Financial responsibility	1	2	3	1	2	3

* NOTE THAT THERE ARE TWO TYPES OF MUNICIPAL SEWAGE SLUDGE LAND APPLICATION UNITS. HIGH APPLICATION RATE UNITS EXCEED CROP NUTRIENT NEEDS WHEREAS LOW APPLICATION RATE UNITS DO NOT. (SEE PAGE III-1). IF YOUR STATE DOES NOT DIFFERENTIATE BETWEEN HIGH AND LOW APPLICATION RATE UNITS, CIRCLE THE SAME CODE IN COLUMNS A AND B FOR EACH REQUIREMENT.

IMPORTANT: SEE DEFINITION OF LAND APPLICATION UNIT TYPE ON PAGE III-1.

Unit Types								
C. Industrial waste			D. Oil or gas waste			E. Other [SPECIFY]: ____ ____ ____		
Specifically included in the regulations	Enforced under general standards and policies	No enforceable requirements	Specifically included in the regulations	Enforced under general standards and policies	No enforceable requirements	Specifically included in the regulations	Enforced under general standards and policies	No enforceable requirements
1	2	3	1	2	3	1	2	3
1	2	3	1	2	3	1	2	3
1	2	3	1	2	3	1	2	3
1	2	3	1	2	3	1	2	3
1	2	3	1	2	3	1	2	3
1	2	3	1	2	3	1	2	3
1	2	3	1	2	3	1	2	3
1	2	3	1	2	3	1	2	3
1	2	3	1	2	3	1	2	3
1	2	3	1	2	3	1	2	3
1	2	3	1	2	3	1	2	3
1	2	3	1	2	3	1	2	3
1	2	3	1	2	3	1	2	3
1	2	3	1	2	3	1	2	3
1	2	3	1	2	3	1	2	3
1	2	3	1	2	3	1	2	3
1	2	3	1	2	3	1	2	3
1	2	3	1	2	3	1	2	3
1	2	3	1	2	3	1	2	3
1	2	3	1	2	3	1	2	3
1	2	3	1	2	3	1	2	3
1	2	3	1	2	3	1	2	3
1	2	3	1	2	3	1	2	3
1	2	3	1	2	3	1	2	3
1	2	3	1	2	3	1	2	3

H2. Please indicate (for each land application unit type) whether the following specific requirements are included in formally proposed State regulations. [IF THERE ARE NO FORMALLY PROPOSED REGULATIONS IN YOUR STATE, PLEASE PLACE A CHECK IN THE BOX: ☐ AND SKIP TO H3.]

Specific requirements included in formally proposed regulations?	Land Application Unit Types									
	A. Municipal sewage sludge at high application rate*		B. Municipal sewage sludge at low application rate*		C. Industrial waste		D. Oil or gas waste		E. Other [SPECIFY]: ______	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
a. Location standards (e.g., floodplains	1	2	1	2	1	2	1	2	1	2
b. Waste application limits	1	2	1	2	1	2	1	2	1	2
c. Restrictions on growing food chain crops	1	2	1	2	1	2	1	2	1	2
d. Restrictions on types of Subtitle D wastes received	1	2	1	2	1	2	1	2	1	2
e. Waste disinfection prior to application	1	2	1	2	1	2	1	2	1	2
f. Soil monitoring	1	2	1	2	1	2	1	2	1	2
g. Groundwater protection standard	1	2	1	2	1	2	1	2	1	2
h. Groundwater monitoring	1	2	1	2	1	2	1	2	1	2
i. Corrective action for groundwater contamination	1	2	1	2	1	2	1	2	1	2
j. Air emission monitoring	1	2	1	2	1	2	1	2	1	2
k. Air protection standards	1	2	1	2	1	2	1	2	1	2
l. Surface water protection standards	1	2	1	2	1	2	1	2	1	2
m. Surface water monitoring	1	2	1	2	1	2	1	2	1	2
n. Corrective action for surface water contamination	1	2	1	2	1	2	1	2	1	2
o. Run-off collection and removal	1	2	1	2	1	2	1	2	1	2
p. Run-off characterization/analysis	1	2	1	2	1	2	1	2	1	2
q. Run-off treatment	1	2	1	2	1	2	1	2	1	2
r. Run-on controls	1	2	1	2	1	2	1	2	1	2
s. Endangered species criteria	1	2	1	2	1	2	1	2	1	2
t. Disease vectors criteria	1	2	1	2	1	2	1	2	1	2
u. Safety criteria: Bird hazards	1	2	1	2	1	2	1	2	1	2
v. Safety criteria: Uncontrolled access	1	2	1	2	1	2	1	2	1	2
w. Closure standards	1	2	1	2	1	2	1	2	1	2
x. Postclosure monitoring	1	2	1	2	1	2	1	2	1	2
y. Financial responsibility	1	2	1	2	1	2	1	2	1	2

* NOTE THAT THERE ARE TWO TYPES OF MUNICIPAL SEWAGE SLUDGE LAND APPLICATION UNITS. HIGH APPLICATION RATE UNITS EXCEED CROP NUTRIENT NEEDS WHEREAS LOW APPLICATION RATE UNITS DO NOT. (SEE PAGE III-1). IF YOUR STATE DOES NOT DIFFERENTIATE BETWEEN HIGH AND LOW APPLICATION RATE UNITS, CIRCLE THE SAME CODE IN COLUMNS A AND B FOR EACH REQUIREMENT.

H3. In the table below, indicate whether your State currently requires permits/plan approval or licenses/registration for each of the listed types of Subtitle D land application units. [CIRCLE ONE CODE FOR EACH TYPE OF LAND APPLICATION UNIT]

Land application unit type	A. Permit or plan approval required?		B. License or registration required?	
	Yes	No	Yes	No
a. Municipal sewage sludge at high application rate*.	1	2	1	2
b. Municipal sewage sludge at low application rate* .	1	2	1	2
c. Industrial waste	1	2	1	2
d. Oil or gas waste	1	2	1	2
e. Other [SPECIFY]: ______________________________	1	2	1	2

* NOTE THAT THERE ARE TWO TYPES OF MUNICIPAL SEWAGE SLUDGE LAND APPLICATION UNITS. HIGH APPLICATION RATE UNITS EXCEED CROP NUTRIENT NEEDS WHEREAS LOW APPLICATION RATE UNITS DO NOT. (SEE PAGE III-1). IF YOUR STATE DOES NOT DIFFERENTIATE BETWEEN HIGH AND LOW APPLICATION RATE UNITS, CIRCLE THE SAME CODE IN COLUMNS A AND B FOR EACH REQUIREMENT.

COMMENTS: [PLEASE EXPLAIN IF PERMIT REQUIREMENTS VARY WITHIN A CATEGORY, E.G. - SOME INDUSTRIAL WASTE LAND APPLICATION UNITS REQUIRE PERMITS AND OTHERS DON'T]

H4. How many of the active individual Subtitle D land application units of each type in your State currently have permits/approved plans or licenses/registration?

Land application unit type	Number of individual Subtitle D land application units that have permits or approved plans	Number of individual Subtitle D land application units licensed or registered
a. Municipal sewage sludge at high application rate*	________	________
b. Municipal sewage sludge at low application rate*	________	________
a+b Total municipal sewage sludge*.	________	________
c. Industrial waste.	________	________
d. Oil or gas waste.	________	________
e. Other (SPECIFY): ________________ ________________________	________	________

* IF YOUR STATE DOES NOT DISTINGUISH MUNICIPAL SEWAGE SLUDGE LAND APPLICATION UNITS BY HIGH AND LOW APPLICATION RATES (SEE PAGE III-1), ENTER "NA" ON LINES a AND b, AND ENTER THE NUMBER OF MUNICIPAL SEWAGE SLUDGE UNITS IN EACH COLUMN ON LINE a+b.

H5. Is there a written or published schedule of your State's permit fees for Subtitle D land application units? [CIRCLE ONLY ONE CODE]

Yes [PLEASE ATTACH A COPY OF THE FEE SCHEDULE TO THE BACK OF THIS QUESTIONNAIRE]	1
No.	2
N/A [THERE ARE NO PERMIT FEES IN MY STATE].	3

H6. Please attach a copy of your State's Subtitle D land application unit regulations (existing and proposed, if any) to the back of this questionnaire.

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IMPORTANT NOTE: 1984 REFERS TO CALENDAR YEAR 1984 THROUGHOUT THE REMAINING QUESTIONNAIRE.

I. ENFORCEMENT OF LAND APPLICATION UNIT REGULATIONS

I1. How many inspections for compliance with State Subtitle D regulations were made during 1984 for each type of land application unit listed below? [COUNT INDIVIDUAL INSPECTIONS, E.G., IF YOU HAD 100 LAND APPLICATION UNITS AND EACH WAS INSPECTED TWICE DURING CALENDAR YEAR 1984, YOUR NUMBER OF INSPECTIONS WOULD BE 200]

	Land application unit type	Number of inspections during 1984
a.	Municipal sewage sludge at high application rate*	______
b.	Municipal sewage sludge at low application rate*.	______
a+b	**Total municipal sewage sludge*. . . . .**	______
c.	Industrial waste.	______
d.	Oil or gas waste.	______
e.	Other (SPECIFY): ______________________ ______________________	______
e.	TOTAL NUMBER OF INSPECTIONS DURING 1984.	

* IF YOUR STATE DOES NOT DISTINGUISH MUNICIPAL SEWAGE SLUDGE LAND APPLICATION UNITS BY HIGH AND LOW APPLICATION RATES (SEE PAGE III-1), ENTER "NA" ON LINES a AND b, AND ENTER THE NUMBER OF INSPECTIONS OF MUNICIPAL SEWAGE SLUDGE UNITS ON LINE a+b.

I2. How frequently are individual Subtitle D land application units inspected for compliance? [ENTER THE PERCENTAGE OF LAND APPLICATION UNITS FALLING IN EACH FREQUENCY OF INSPECTION CATEGORY]

Frequency of Inspection

Land application unit type	A. Never Inspected	B. Less than once every two years	C. Once every two years	D. Once a year	E. Twice a year	F. Four times a year	G. More than four times a year	H. Other [SPECIFY FOR EACH TYPE]:	I. Total [SHOULD EQUAL 100%]
a. Municipal sewage sludge at high application rate*	___%	___%	___%	___%	___%	___%	___%	________%	100%
b. Municipal sewage sludge at low application rate*	___%	___%	___%	___%	___%	___%	___%	________%	
a+b Total municipal sewage sludge*	___%	___%	___%	___%	___%	___%	___%	________%	100%
c. Industrial waste	___%	___%	___%	___%	___%	___%	___%	________%	100%
d. Oil or gas waste	___%	___%	___%	___%	___%	___%	___%	________%	100%
e. Other [SPECIFY]: ________ ________	___%	___%	___%	___%	___%	___%	___%	________%	100%

* IF YOUR STATE DOES NOT DISTINGUISH MUNICIPAL SEWAGE SLUDGE LAND APPLICATION UNITS BY HIGH AND LOW APPLICATION RATES (SEE PAGE III-1), ENTER "NA" ON LINES a AND b, AND ENTER THE PERCENTAGE OF ALL MUNICIPAL SEWAGE SLUDGE UNITS IN EACH COLUMN ON LINE a+b.

I3. Do you have a checklist of criteria for inspections? [CIRCLE ONLY ONE CODE]

Yes [PLEASE ATTACH A COPY OF THE CHECKLIST TO THE BACK OF THIS QUESTIONNAIRE] 1
No. 2

I4. In the table below, please describe the number and types of violations that were found by your State's 1984 land application unit inspection program. In Columns A through E, report the number of individual Subtitle D land application units that had at least one violation of the types listed below.

Violation type	Number of individual Subtitle D land application units (by type) in violation in 1984:					
	A. Municipal sewage sludge at high application rate**	B. Municipal sewage sludge at low application rate**	**A+B Total municipal sewage sludge****	C. Industrial waste and	D. Oil or gas waste	E. Other [SPECIFY]: ______ ______
a. Groundwater contamination*.......						
b. Groundwater monitoring program deficiencies.........						
c. Surface water contamination*.......						
d. Air contamination*...						
e. Operational deficiencies and other minor violations...........						
f. Other violations in 1984 [SPECIFY]: ______ ______ ______						

*[PLEASE USE THAT DEFINITION OF CONTAMINATION THAT BEST APPLIES TO YOUR STATE WHEN ANSWERING THIS QUESTION, I.E., THE DEFINITION USED IN YOUR STATE (e.g., IN REGS, ETC.)]

** IF YOUR STATE DOES NOT DISTINGUISH MUNICIPAL SEWAGE SLUDGE LAND APPLICATION UNITS BY HIGH AND LOW APPLICATION RATES (SEE PAGE III-1), ENTER "NA" IN COLUMNS A AND B, AND ENTER THE NUMBER OF MUNICIPAL SEWAGE SLUDGE UNITS FOR EACH VIOLATION TYPE IN COLUMN A+B.

J. THE NUMBER OF ACTIVE INDIVIDUAL SUBTITLE D LAND APPLICATION UNITS AND THE NUMBER OF ESTABLISHMENTS WITH ACTIVE LAND APPLICATION UNITS

The objective of this section is to obtain information on the number of active individual Subtitle D land application units (both permitted and unpermitted), and the number of establishments with Subtitle D land application units. [SEE GENERAL INSTRUCTIONS FOR A DIAGRAM AND DEFINITIONS OF LAND APPLICATION UNIT AND ESTABLISHMENT]

J1. During 1984, how many individual Subtitle D land application units were active in your State? (For the purpose of the questions in Section D, the term "active" means "received waste in 1984.")

NUMBER OF ACTIVE
INDIVIDUAL SUBTITLE D
LAND APPLICATION UNITS IN 1984: ____________________

J2. In the table below, please enter the number of active individual Subtitle D land application units in 1984 in each of the following categories.

	Land application unit type	Number of active individual Subtitle D land application units in 1984
a.	Municipal sewage sludge at high application rate*.	
b.	Municipal sewage sludge at low application rate*	
a+b	**Total municipal sewage sludge***	
c.	Industrial waste	
d.	Oil or gas waste	
e.	Other [SPECIFY]: ____________________	
e.	TOTAL SHOULD EQUAL RESPONSE TO QUESTION J1:	

* IF YOUR STATE DOES NOT DISTINGUISH MUNICIPAL SEWAGE SLUDGE LAND APPLICATION UNITS BY HIGH AND LOW APPLICATION RATES (SEE PAGE III-1), ENTER "NA" ON LINES a AND b, AND ENTER THE NUMBER OF MUNICIPAL SEWAGE SLUDGE UNITS ON LINE a+b.

J3. How many establishments in your State had active Subtitle D land application units in 1984? (An establishment is defined as a single physical location where business is conducted or where services or industrial operations are performed by a municipality, corporation, or other public or private entity. An establishment may have two or more land application units).

NUMBER OF ESTABLISHMENTS
WITH ACTIVE SUBTITLE D LAND
APPLICATION UNITS IN 1984: ____________________

J4. In the table below, please enter the number of individual active Subtitle D land application units in 1984 (by land application unit type) in each of the ownership categories listed.

Land application unit type	Number of individual active Subtitle D land application units					
	A. Owned by State government	B. Owned by local governments	C. Owned by Federal government	D. Privately owned	E. Other*	F. Total number of land application units by type [THIS SHOULD EQUAL THE NUMBER IN J2]
a. Municipal sewage sludge at high application rate**...						
b. Municipal sewage sludge at low application rate**...						
a+b Total municipal sewage sludge........**						
c. Industrial waste...........						
d. Oil or gas waste...........						
e. Other [SPECIFY]: ______________ ______________ ______________						

* [SPECIFY "OTHER" OWNERSHIP CATEGORY, IF USED]: ______________________________

** IF YOUR STATE DOES NOT DISTINGUISH MUNICIPAL SEWAGE SLUDGE LAND APPLICATION UNITS BY HIGH AND LOW APPLICATION RATES (SEE PAGE III-1), ENTER "NA" ON LINES a AND b, AND ENTER THE NUMBER OF MUNICIPAL SEWAGE SLUDGE UNITS IN EACH COLUMN ON LINE a+b.

K. LAND APPLICATION UNIT DESIGN AND OPERATING CHARACTERISTICS

The objective of this section is to determine the design and operating characteristics of Subtitle D land application units.

K1. In the table below, please enter the number of active individual Subtitle D land application units in 1984 (by land application unit type) in each of the land application unit acreage categories listed. (Acreage should include active, inactive, and closed portions of each land application unit. Column E totals should equal the distribution of individual land application units in Question J2.) In Column F, please indicate the total acreage of each land application unit type.

Land application unit type	Number of active individual Subtitle D land application units with:					
	A. Less than 10 acres	B. 10 - 49 acres	C. 50 - 99 acres	D. 100 acres or more	E. Total number of land application units by type	F. Total acreage of land application units by type
a. Municipal sewage sludge at high application rate*.						
b. Municipal sewage sludge at low application rate*.						
a+b Total municipal sewage sludge*....						
c. Industrial waste.............						
d. Oil or gas waste.............						
e. Other [SPECIFY]: ________________ ________________ ________________						
f. TOTAL NUMBER OF LAND APPLICATION UNITS BY ACREAGE CATEGORY (COLUMNS A-E AND TOTAL ACREAGE (COLUMN F)........						

* IF YOUR STATE DOES NOT DISTINGUISH MUNICIPAL SEWAGE SLUDGE LAND APPLICATION UNITS BY HIGH AND LOW APPLICATION RATES (SEE PAGE III-1), ENTER "NA" ON LINES a AND b, AND ENTER THE NUMBER OF MUNICIPAL SEWAGE SLUDGE UNITS IN EACH COLUMN ON LINE a+b.

K2. In the table below, please enter the number of active individual Subtitle D land application units (by land application unit type) according to the amount of waste received in 1984. Column E totals should equal the number of land application units in question J2.

Land application unit type	Number of active individual Subtitle D land application units by amount of waste received in 1984:				
	A. Received less than 50 tons per year (dry weight)	B. Received 50 - 99 tons per year (dry weight)	C. Received 100-999 tons per year (dry weight)	D. Received 1,000 or more tons per year (dry weight)	E. Total number of land application units by typed [THIS SHOULD EQUAL THE NUMBER IN J2]
a. Municipal sewage sludge at high application rate*....					
b. Municipal sewage sludge at low application rate*....					
a+b Total municipal sewage sludge*.......					
c. Industrial waste.....					
d. Oil or gas waste.....					
e. Other [SPECIFY]: ____________ ____________					
f. TOTAL NUMBER OF LAND APPLICATION UNITS BY CATEGORY					

* IF YOUR STATE DOES NOT DISTINGUISH MUNICIPAL SEWAGE SLUDGE LAND APPLICATION UNITS BY HIGH AND LOW APPLICATION RATES (SEE PAGE III-1), ENTER "NA" ON LINES a AND b, AND ENTER THE NUMBER OF MUNICIPAL SEWAGE SLUDGE UNITS IN EACH COLUMN ON LINE a+b.

K3. Certain non-household hazardous wastes are exempted from Federal and some State hazardous waste regulations if generated in small quantities. Please indicate the percentage of Subtitle D land application units of each type that receive such wastes?

Land application unit type	Percent that receive exempted non-household hazardous wastes.
a. Municipal sewage sludge at high application rate*.	_____%
b. Municipal sewage sludge at low application rate* .	_____%
a+b Total municipal sewage sludge*	_____%
c. Industrial waste	_____%
d. Agricultural waste	_____%
e. Other [SPECIFY): ____________________ ____________________	_____%

* IF YOUR STATE DOES NOT DISTINGUISH MUNICIPAL SEWAGE SLUDGE LAND APPLICATION UNITS BY HIGH AND LOW APPLICATION RATES (SEE PAGE III-1), ENTER "NA" ON LINES a AND b, AND ENTER THE NUMBER OF MUNICIPAL SEWAGE SLUDGE UNITS IN EACH COLUMN ON LINE a+b.

K4. In the table below, please enter the number of active individual Subtitle D land application units that had groundwater, surface water, air and soil monitoring in 1984.

Land application unit type	Number of active individual Subtitle D land application units that had:			
	A. Groundwater Monitoring	B. Surface Water Monitoring	C. Air Monitoring	D. Soil Monitoring
a. Municipal sewage sludge at high application rate*.................				
b. Municipal sewage sludge at low application rate*.................				
a+b Total municipal sewage sludge*....				
c. Industrial waste..................				
d. Oil or gas waste..................				
e. Other [SPECIFY]: ____________________ ____________________				

* IF YOUR STATE DOES NOT DISTINGUISH MUNICIPAL SEWAGE SLUDGE LAND APPLICATION UNITS BY HIGH AND LOW APPLICATION RATES (SEE PAGE III-1), ENTER "NA" ON LINES a AND b, AND ENTER THE NUMBER OF MUNICIPAL SEWAGE SLUDGE UNITS IN EACH COLUMN ON LINE a+b.

K5. In the table below, please estimate the number of active individual Subtitle D land application units (by land application unit type) that had or used the following release prevention/management methods in 1984:

Management method	Number of active individual Subtitle D land application units:					
	A. Municipal sewage sludge at high application rate*	B. Municipal sewage sludge at low application rate*	**A+B Total municipal sewage sludge****	C. Industrial wastes	D. Oil or gas waste	E. Other [SPECIFY]:
a. Run-on/run-off controls. .						
b. Waste restrictions (ban on certain Subtitle D waste types)						
c. Waste application rate limits						
d. Restrictions on the growing of food chain crops.						

* IF YOUR STATE DOES NOT DISTINGUISH MUNICIPAL SEWAGE SLUDGE LAND APPLICATION UNITS BY HIGH AND LOW APPLICATION RATES (SEE PAGE III-1), ENTER "NA" IN COLUMNS A AND B, AND ENTER THE NUMBER OF MUNICIPAL SEWAGE SLUDGE UNITS FOR EACH MANAGEMENT METHOD IN COLUMN A+B.

K6. Are there tipping fees (i.e., fees or charges levied on disposers, transporters, or collectors bringing Subtitle D waste to a land application unit) for land application unit customers for disposal of solid waste in your State? [CIRCLE ONE CODE ONLY FOR EACH LAND APPLICATION UNIT TYPE]

Land application unit type	Are there tipping fees?	
	Yes	No
a. Municipal sewage sludge at high application rate*	1	2
b. Municipal sewage sludge at low application rate*.	1	2
c. Industrial waste.	1	2
d. Oil or gas waste.	1	2
e. Other [SPECIFY]: ____________________	1	2

* IF MUNICIPAL SEWAGE SLUDGE UNITS ARE NOT DISTINGUISHED BY HIGH AND LOW APPLICATION RATES, CIRCLE THE SAME CODE FOR LINES a AND b.

L. AVAILABILITY OF LAND APPLICATION UNIT DATA

L1. In the table below, please estimate the proportion of individual Subtitle D land application units (by land application unit type) for which your State has each type of monitoring data available:

Land application unit type	A. Groundwater monitoring data available for: [CIRCLE ONE CODE FOR EACH LAND APPLICATION UNIT TYPE]			B. Surface water monitoring data available for: [CIRCLE ONE CODE FOR EACH LAND APPLICATION UNIT TYPE]			C. Soil monitoring data available for: [CIRCLE ONE CODE FOR EACH LAND APPLICATION UNIT TYPE]		
	None (0%)	Some (1-50%)	Most (>50%)	None (0%)	Some (1-50%)	Most (>50%)	None (0%)	Some (1-50%)	Most (>50%)
a. Municipal sewage sludge at high application rate*	1	2	3	1	2	3	1	2	3
b. Municipal sewage sludge at low application rate*	1	2	3	1	2	3	1	2	3
c. Industrial waste	1	2	3	1	2	3	1	2	3
d. Oil or gas waste	1	2	3	1	2	3	1	2	3
e. Other [SPECIFY]: ________ ________ ________	1	2	3	1	2	3	1	2	3

* IF MUNICIPAL SEWAGE SLUDGE UNITS ARE NOT DISTINGUISHED BY HIGH AND LOW APPLICATION RATES, CIRCLE THE SAME CODE FOR LINES a AND b.

D. Air emissions monitoring data available for: [CIRCLE ONE CODE FOR EACH LAND APPLICATION UNIT TYPE]		
None (0%)	Some (1-50%)	Most (>50%)
1	2	3
1	2	3
1	2	3
1	2	3
1	2	3

L2. Please estimate the number of individual Subtitle D land application units (by land application unit type) for which your State has case studies. (Case studies include monitoring data, but in addition include a sufficient level of detail on site design and operating practices to provide some indication of the causes for the success or failure of the land application unit to protect human health and the environment. Some case studies may also include information on design and operating costs of the land application unit and tipping fees.)

[IF YOU ARE NOT AWARE OF ANY CASE STUDIES OF SUBTITLE D LAND APPLICATION UNITS IN YOUR STATE, PLEASE PLACE A CHECK (✓) IN THE BOX: ☐, AND SKIP TO QUESTION L4.]

Land application unit type	Number of individual Subtitle D land application units		
	A. With case studies	B. With case studies that include design and operating costs	C. With case studies that include tipping fees
a. Municipal sewage sludge at high application rate*..	______	______	______
b. Municipal sewage sludge at low application rate*...	______	______	______
a+b Total municipal sewage sludge....................	______	______	______
c. Industrial waste..........	______	______	______
d. Oil or gas waste..........	______	______	______
e. Other [SPECIFY]: ______ ______	______	______	______

* IF YOUR STATE DOES NOT DISTINGUISH MUNICIPAL SEWAGE SLUDGE LAND APPLICATION UNITS BY HIGH AND LOW APPLICATION RATES (SEE PAGE III-1), ENTER "NA" ON LINES a AND b, AND ENTER THE NUMBER OF MUNICIPAL SEWAGE SLUDGE UNITS IN EACH COLUMN ON LINE a+b.

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L3. List any alternate sources of case study information that you know of in your State (e.g., local governments that have land application unit case study data).

SOURCE:	CONTACT PERSON	(AREA CODE) TELEPHONE
		( )
		( )
		( )

L4. Does your State already have a list (or file) of establishments with Subtitle D land application units?

Yes [GO ON TO QUESTION L5]. 1
No [SKIP TO QUESTION M1]. 2

L5. In what format is(are) the list(s)? [EXAMPLES: ON A COMPUTER FILE, IN A CARD FILE, ON A WORD PROCESSING DISK, ETC.]

L6. What does(do) the list(s) cover? [EXAMPLES: PERMITTED LAND APPLICATION UNITS ONLY, INDUSTRIAL LAND APPLICATION UNITS ONLY, ALL TYPES OF LAND APPLICATION UNITS THAT ARE LARGER THAN ONE ACRE, ETC.]

L7. If possible, please attach copies of any list(s) to this completed questionnaire. If this is not possible, please indicate below how EPA could obtain a list of land application units in your State.

M. CONTACT INFORMATION AND COMMENTS AND ATTACHMENTS: LAND APPLICATION UNITS

M1. Please identify a contact person for this land application units section of the survey, should it be necessary to clarify responses:

Contact Name: ______________________________

Title: ______________________________

Agency/Program: ______________________________

Telephone: (   ) ____________________ Ext.: __________

M2. COMMENTS - Please include any comments or further amplification of responses to Sections H through L below or on attached sheets.

____

____

____

____

____

____

____

____

____

____

____

M3. CHECKLIST OF ATTACHMENTS TO PART III - LAND APPLICATION UNITS:
[Please check (✓) the appropriate box if you have attached the following]:

a. Schedule of State permit fees (Question H5) . . . . ☐
b. State Subtitle D land application unit regulations (Question H6). . . . ☐
c. Checklist of State criteria for inspections (Question I3) . . . . ☐
d. List of establishments with Subtitle D land application units (Question L7) . . . . ☐
e. Attached comment sheets (Question M2) . . . . ☐

U.S. ENVIRONMENTAL PROTECTION AGENCY
STATE SUBTITLE D PROGRAM QUESTIONNAIRE

PART IV - SURFACE IMPOUNDMENTS
(Sections N-S)

IMPORTANT: BEFORE PROCEEDING WITH THIS SECTION, READ THE GENERAL INSTRUCTIONS AT THE FRONT OF THIS QUESTIONNAIRE CAREFULLY. PLEASE PAY SPECIAL ATTENTION TO THE DEFINITIONS BELOW.

SURFACE IMPOUNDMENT - A part of an establishment which is a natural topographic depression, man-made excavation, or diked area formed primarily of earthen materials (although it may be lined with man-made materials) that is designed to hold an accumulation of liquid wastes or wastes containing free liquids. Treatment, storage, and disposal surface impoundments are included. Surface impoundments are often referred to as pits, ponds, or lagoons. This definition does not include any type of tank, including concrete, fiberglass or steel tanks.

Municipal Wastewater Surface Impoundment - A publicly owned surface impoundment, commonly known as a sewage lagoon or sewage pond, designed to provide partial or total treatment for domestic sewage or a mixture of domestic and industrial wastewater.

Municipal Sewage Sludge Surface Impoundment - A surface impoundment that receives sewage sludge from publicly-owned or privately-owned domestic sewage treatment establishments, including septic tanks.

Municipal Run-off Surface Impoundment - A surface impoundment that is used for the collection of run-off or leachate from municipal waste landfills or municipal waste land application units.

Industrial Waste Surface Impoundment - A surface impoundment that primarily receives wastes from factories, processing plants (including food processing), and other manufacturing or commercial activities. Also included in this category are surface impoundments used for the collection of run-off or leachate from industrial or demolition landfills and industrial land application units.

Agricultural Waste Surface Impoundment - A surface impoundment that only receives waste from agricultural operations, including farming, crop production, and animal husbandry (including feedlots). Specifically excluded from this category are surface impoundments that are used for wastes from slaughter houses, other animal processing, and food processing, which are included in the "industrial" category.

Mining Waste Surface Impoundment - A surface impoundment associated with mineral extraction and beneficiation activities such as crushing, screening, washing, floatation, etc. These minerals include metallic and non-metallic ores, coal, sand and gravel, but exclude oil and gas. Specifically excluded are impoundments used for processing wastes from manufacturing establishments which are included in the "industrial" category.

Oil or Gas Waste Surface Impoundment - A surface impoundment that receives waste from oil or gas exploration and extraction, commonly known as brine pits. Both disposal and emergency brine pits are included. Specifically excluded are impoundments used for petroleum refinery wastes, which are included in the "industrial" category.

Other Surface Impoundment - A surface impoundment receiving Subtitle D wastes that does not fall into any of the above categories (e.g., a drinking water treatment waste impoundment).

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N. SUBTITLE D SURFACE IMPOUNDMENT REGULATIONS

The objective of this section is to gather current information on existing and proposed State regulations and permits.

N1. The table below presents a list of specific requirements for Subtitle D surface impoundments. For each column A through H, circle code 1 if these requirements are specifically included in the State regulations. Circle code 2 if these requirements are not specifically included in the State regulations, but can be enforced under general performance standards or State policies. Circle code 3 if there are no enforceable requirements. [FOR EACH REQUIREMENT, PLEASE CIRCLE ONLY ONE CODE FOR EACH SURFACE IMPOUNDMENT TYPE]

Requirements included in current State Subtitle D program?	Surface Impoundment					
	A. Municipal wastewater			B. Municipal sewage sludge		
	Specifically included in the regulations	Enforced under general standards and policies	No enforceable requirements	Specifically included in the regulations	Enforced under general standards and policies	No enforceable requirements
a. Location standards (e.g., floodplains)	1	2	3	1	2	3
b. Natural liners (e.g., clay)	1	2	3	1	2	3
c. Synthetic liners	1	2	3	1	2	3
d. Leak detection system	1	2	3	1	2	3
e. Groundwater protection standard	1	2	3	1	2	3
f. Groundwater monitoring	1	2	3	1	2	3
g. Corrective action for groundwater contamination	1	2	3	1	2	3
h. Air protection standard	1	2	3	1	2	3
i. Air emission monitoring	1	2	3	1	2	3
j. Surface water protection standards	1	2	3	1	2	3
k. Surface water monitoring	1	2	3	1	2	3
l. Corrective action for surface water contamination	1	2	3	1	2	3
m. Overtopping controls (freeboard)	1	2	3	1	2	3
n. Dike stability criteria	1	2	3	1	2	3
o. Restrictions on types of Subtitle D wastes received	1	2	3	1	2	3
p. Endangered species criteria	1	2	3	1	2	3
q. Disease vectors criteria	1	2	3	1	2	3
r. Safety criteria: Uncontrolled access	1	2	3	1	2	3
s. Closure standards (example: caps)	1	2	3	1	2	3
t. Postclosure monitoring	1	2	3	1	2	3
u. Financial responsibility	1	2	3	1	2	3

IMPORTANT: SEE DEFINITION OF SURFACE IMPOUNDMENT TYPE ON PAGE IV-1.

E THROUGH H COLUMNS OF THIS QUESTION ARE ON PAGES IV-4 AND IV-5

Types					
C. Municipal run-off			D. Industrial waste		
Specifically included in the regulations	Enforced under general standards and policies	No enforceable requirements	Specifically included in the regulations	Enforced under general standards and policies	No enforceable requirements
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3

(Question N1, continued)

Requirements included in current State Subtitle D program?	Surface Impoundment					
	E. Agricultural waste			F. Mining waste		
	Specifically included in the regulations	Enforced under general standards and policies	No enforceable requirements	Specifically included in the regulations	Enforced under general standards and policies	No enforceable requirements
a. Location standards (e.g., floodplains)	**1**	**2**	**3**	**1**	**2**	**3**
b. Natural liners (e.g., clay)	**1**	**2**	**3**	**1**	**2**	**3**
c. Synthetic liners	**1**	**2**	**3**	**1**	**2**	**3**
d. Leak detection system	**1**	**2**	**3**	**1**	**2**	**3**
e. Groundwater protection standard	**1**	**2**	**3**	**1**	**2**	**3**
f. Groundwater monitoring	1	2	3	1	2	3
g. Corrective action for groundwater contamination	1	2	3	1	2	3
h. Air protection standard	1	2	3	1	2	3
i. Air emission monitoring	1	2	3	1	2	3
j. Surface water protection standards	1	2	3	1	2	3
k. Surface water monitoring	**1**	**2**	**3**	**1**	**2**	**3**
l. Corrective action for surface water contamination	**1**	**2**	**3**	**1**	**2**	**3**
m. Overtopping controls (freeboard)	**1**	**2**	**3**	**1**	**2**	**3**
n. Dike stability criteria	**1**	**2**	**3**	**1**	**2**	**3**
o. Restrictions on types of Subtitle D wastes received	**1**	**2**	**3**	**1**	**2**	**3**
p. Endangered species criteria	1	2	3	1	2	3
q. Disease vectors criteria	1	2	3	1	2	3
r. Safety criteria: Uncontrolled access	1	2	3	1	2	3
s. Closure standards (example: caps)	1	2	3	1	2	3
t. Postclosure monitoring	1	2	3	1	2	3
u. Financial responsibility	**1**	**2**	**3**	**1**	**2**	**3**

Types					
G. Oil or gas waste			H. Other (e.g., drinking water treatment sludges) [SPECIFY]: ________________ ________________		
Specifically included in the regulations	Enforced under general standards and policies	No enforceable requirements	Specifically included in the regulations	Enforced under general standards and policies	No enforceable requirements
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3
1	2	3	1	2	3

N2. Please indicate (for each surface impoundment type) whether the following specific requirements are included in formally proposed State regulations. [IF THERE ARE NO FORMALLY PROPOSED REGULATIONS IN YOUR STATE, PLEASE PLACE A CHECK (✓) IN THE BOX: ☐ AND SKIP TO N3.]

Specific requirements included in formally proposed regulations?	Surface Impoundment							
	A. Municipal wastewater		B. Municipal sewage sludge		C. Municipal run-off		D. Industrial waste	
	Yes	No	Yes	No	Yes	No	Yes	No
a. Location standards (e.g., floodplains)	1	2	1	2	1	2	1	2
b. Natural liners (e.g., clay)	1	2	1	2	1	2	1	2
c. Synthetic liners	1	2	1	2	1	2	1	2
d. Leak detection system	1	2	1	2	1	2	1	2
e. Groundwater protection standard	1	2	1	2	1	2	1	2
f. Groundwater monitoring	1	2	1	2	1	2	1	2
g. Corrective action for groundwater contamination	1	2	1	2	1	2	1	2
h. Air protection standard	1	2	1	2	1	2	1	2
i. Air emission monitoring	1	2	1	2	1	2	1	2
j. Surface water protection standards	1	2	1	2	1	2	1	2
k. Surface water monitoring	1	2	1	2	1	2	1	2
l. Corrective action for surface water contamination	1	2	1	2	1	2	1	2
m. Overtopping controls (freeboard)	1	2	1	2	1	2	1	2
n. Dike stability criteria	1	2	1	2	1	2	1	2
o. Restrictions on types of Subtitle D wastes received	1	2	1	2	1	2	1	2
p. Endangered species criteria	1	2	1	2	1	2	1	2
q. Disease vectors criteria	1	2	1	2	1	2	1	2
r. Safety criteria: Uncontrolled access	1	2	1	2	1	2	1	2
s. Closure standards (example: caps)	1	2	1	2	1	2	1	2
t. Postclosure monitoring	1	2	1	2	1	2	1	2
u. Financial responsibility	1	2	1	2	1	2	1	2

Types							
E. Agricultural waste		F. Mining waste		G. Oil or gas waste		H. Other (e.g., drinking water treatment sludges [SPECIFY]: ______ ______	
Yes	No	Yes	No	Yes	No	Yes	No
1	2	1	2	1	2	1	2
1	2	1	2	1	2	1	2
1	2	1	2	1	2	1	2
1	2	1	2	1	2	1	2
1	2	1	2	1	2	1	2
1	2	1	2	1	2	1	2
1	2	1	2	1	2	1	2
1	2	1	2	1	2	1	2
1	2	1	2	1	2	1	2
1	2	1	2	1	2	1	2
1	2	1	2	1	2	1	2
1	2	1	2	1	2	1	2
1	2	1	2	1	2	1	2
1	2	1	2	1	2	1	2
1	2	1	2	1	2	1	2
1	2	1	2	1	2	1	2
1	2	1	2	1	2	1	2
1	2	1	2	1	2	1	2
1	2	1	2	1	2	1	2
1	2	1	2	1	2	1	2
1	2	1	2	1	2	1	2

N3. In the table below, indicate whether your State currently requires permits, plan approval or licenses/registration for each of the listed types of Subtitle D surface impoundments. [PLEASE CIRCLE EITHER "1" OR "2" FOR EACH TYPE OF SURFACE IMPOUNDMENT FOR BOTH PERMITS AND LICENSES.]

Surface impoundment type	A. Permit or plan approval required?		B. License or registration required?	
	Yes	No	Yes	No
a. Municipal wastewater	1	2	1	2
b. Municipal sewage sludge	1	2	1	2
c. Municipal run-off	1	2	1	2
d. Industrial waste	1	2	1	2
e. Agricultural waste	1	2	1	2
f. Mining weste	1	2	1	2
g. Oil or gas waste	1	2	1	2
h. Other (e.g., drinking water treatment sludges) [SPECIFY]: ______________________	1	2	1	2

COMMENTS: [PLEASE EXPLAIN IF PERMIT REQUIREMENTS VARY WITHIN A CATEGORY, E.G. - SOME INDUSTRIAL WASTE SURFACE IMPOUNDMENTS REQUIRE PERMITS AND OTHERS DON'T]

____

____

____

N4. How many of the active individual Subtitle D surface impoundments of each type in your State currently have permits/plan approval or licenses/registration?

Surface impoundment type	Number of individual Subtitle D surface impoundments that have permits or plan approval	Number of individual Subtitle D surface impoundments licensed or registered
a. Municipal wastewater	________	________
b. Municipal sewage sludge.	________	________
c. Municipal run-off.	________	________
d. Industrial waste	________	________
e. Agricultural waste	________	________
f. Mining waste	________	________
g. Oil or gas waste	________	________
h. Other (e.g., drinking water treatment sludges) [SPECIFY]: ____________________ ______________________________	________	________

N5. Is there a written or published schedule of your State's permit fees for Subtitle D surface impoundments? [CIRCLE ONLY ONE CODE]

Yes [PLEASE ATTACH A COPY OF THE FEE SCHEDULE TO THE BACK OF THIS QUESTIONNAIRE] 1
No. 2
N/A [THERE ARE NO SURFACE IMPOUNDMENT PERMIT FEES IN MY STATE] 3

N6. Please attach a copy of your State's Subtitle D surface impoundment regulations (existing and proposed, if any) to the back of this questionnaire.

IMPORTANT NOTE: 1984 REFERS TO CALENDAR
YEAR 1984 THROUGHOUT THE
REMAINING QUESTIONNAIRE.

O. ENFORCEMENT OF SURFACE IMPOUNDMENT REGULATIONS

O1. How many inspections for compliance with State Subtitle D regulations were made during 1984 for each type of surface impoundment listed below? [COUNT INDIVIDUAL INSPECTIONS, E.G., IF YOU HAD 100 SURFACE IMPOUNDMENTS AND EACH WAS INSPECTED TWICE DURING CALENDAR YEAR 1984, YOUR NUMBER OF INSPECTIONS WOULD BE 200]

Surface impoundment type	Number of inspections during 1984
a. Municipal wastewater	________
b. Municipal sewage sludge.	________
c. Municipal run-off	________
d. Industrial waste	________
e. Agricultural waste	________
f. Mining waste	________
g. Oil or gas waste	________
h. Other (e.g., drinking water treatment sludges) [SPECIFY]: ______________________________ ______________________________	________
i. TOTAL NUMBER OF INSPECTIONS DURING 1984.	

02. How frequently are individual Subtitle D surface impoundments inspected for compliance? [ENTER THE PERCENTAGE OF SURFACE IMPOUNDMENTS FALLING IN EACH FREQUENCY OF INSPECTION CATEGORY]

Surface impoundment type	Frequency of Inspection								
	A. Never Inspected	B. Less than once every two years	C. Once every two years	D. Once a year	E. Twice a year	F. Four times a year	G. More than four times a year	H. Other [SPECIFY FOR EACH TYPE]:	I. Total [SHOULD EQUAL 100%]
a. Municipal wastewater	___%	___%	___%	___%	___%	___%	___%	__________%	100%
b. Municipal sewage sludge	___%	___%	___%	___%	___%	___%	___%	__________%	100%
c. Municipal run-off	___%	___%	___%	___%	___%	___%	___%	__________%	100%
d. Industrial waste	___%	___%	___%	___%	___%	___%	___%	__________%	100%
e. Agricultural waste	___%	___%	___%	___%	___%	___%	___%	__________%	100%
f. Mining waste	___%	___%	___%	___%	___%	___%	___%	__________%	100%
g. Oil or gas waste	___%	___%	___%	___%	___%	___%	___%	__________%	100%
d. Other (e.g., drinking water treatment sludges) [SPECIFY]: __________ __________	___%	___%	___%	___%	___%	___%	___%	__________%	100%

03. Do you have a checklist of criteria for inspections? [CIRCLE ONLY ONE CODE]

Yes [PLEASE ATTACH A COPY OF THE CHECKLIST TO THE BACK OF THIS QUESTIONNAIRE]	1
No.	2

04. In the table below, please describe the number and types of violations that were found by your State's 1984 surface impoundment inspection program. In Columns A through H, report the number of individual Subtitle D surface impoundments that had at least one violation of the types listed below.

Violation type	Number of individual Subtitle D surface			
	A. Municipal wastewater	B. Municipal sewage sludge	C. Municipal run-off	D. Industrial waste
a. Groundwater contamination*.........				
b. Groundwater monitoring program deficiencies...............				
c. Surface water contamination*.......				
d. Air contamination*.................				
e. Operational deficiencies and other minor violations.........				
f. Other violations in 1984 [SPECIFY]: ____________________ ____________________ ____________________				

*[PLEASE USE THAT DEFINITION OF CONTAMINATION THAT BEST APPLIES TO YOUR STATE WHEN ANSWERING THIS QUESTION, I.E., THE DEFINITION USED IN YOUR STATE (e.g., IN REGS, ETC.]).

impoundments (by type) in violation in 1984:				
E. Agricultural waste	F. Mining waste	G. Oil or gas waste	H. Other (e.g., drinking water treatment sludges) [SPECIFY]: ________________ ________________	
				a. Groundwater contamination
				b. Groundwater monitoring program deficiencies
				c. Surface water contamination
				d. Air contamination
				e. Operational deficiencies and other minor violations
				f. Other violations in 1984

P. THE NUMBER OF ACTIVE INDIVIDUAL SUBTITLE D SURFACE IMPOUNDMENTS AND THE NUMBER OF ESTABLISHMENTS WITH ACTIVE SURFACE IMPOUNDMENTS

The objective of this section is to obtain information on the number of active individual Subtitle D surface impoundments (both permitted and unpermitted), and the number of establishments with Subtitle D surface impoundments. [SEE GENERAL INSTRUCTIONS FOR A DIAGRAM AND DEFINITIONS OF SURFACE IMPOUNDMENT AND ESTABLISHMENT]

P1. During 1984, how many individual Subtitle D surface impoundments were active in your State? (For the purpose of the questions in Section D, the term "active" means "received waste in 1984.")

NUMBER OF ACTIVE
INDIVIDUAL SUBTITLE D
SURFACE IMPOUNDMENTS IN 1984: ____________________

P2. In the table below, please enter the number of active individual Subtitle D surface impoundments in 1984 in each of the following categories.

Surface impoundment type	Number of active individual Subtitle D surface impoundments in 1984
a. Municipal wastewater.	
b. Municipal sewage sludge	
c. Municipal run-off	
d. Industrial waste.	
e. Agricultural waste.	
f. Mining waste.	
g. Oil or gas waste.	
h. Other (e.g., drinking water treatment sludges) [SPECIFY]: ____________________ ____________________	
i. TOTAL SHOULD EQUAL RESPONSE TO QUESTION P1:	

P3. How many establishments in your State had active Subtitle D surface impoundments in 1984? (An establishment is defined as a single physical location where business is conducted or where services or industrial operations are performed by a municipality, corporation, or other public or private entity. An establishment may have two or more surface impoundments).

NUMBER OF ESTABLISHMENTS
WITH ACTIVE SUBTITLE D
SURFACE IMPOUNDMENTS IN 1984: ____________________

P4. In the table below, please enter the number of individual active Subtitle D surface impoundments in 1984 (by surface impoundment type) in each of the ownership categories listed.

Surface impoundment type	Number of individual active Subtitle D surface impoundments					
	A. Owned by State government	B. Owned by local governments	C. Owned by Federal government	D. Privately owned	E. Other*	F. Total number of surface impoundments by type [THIS SHOULD EQUAL THE NUMBER IN P2]
a. Municipal wastewater....						
b. Municipal sewage sludge.						
c. Municipal run-off.......						
d. Industrial waste.........						
e. Agricultural waste.........						
f. Mining waste..						
g. Oil or gas waste.........						
d. Other (e.g., drinking water treatment sludges) [SPECIFY]: ____________ ____________ ____________						

* [SPECIFY "OTHER" OWNERSHIP CATEGORY, IF USED]: ____________________

Q. SURFACE IMPOUNDMENT DESIGN AND OPERATING CHARACTERISTICS

The objective of this section is to determine the design and operating characteristics of Subtitle D surface impoundments.

Q1. In the table below, please enter the number of active individual Subtitle D surface impoundments in 1984 (by surface impoundment type) in each of the surface impoundment acreage categories listed. (Acreage should include active, inactive, and closed portions of each surface impoundment. Column H totals should equal the distribution of individual surface impoundments in Question P2.)

Surface impoundment type	Number of active individual Subtitle D		
	A. Less than one tenth acre	B. 0.1 - 0.4 acres	C. 0.5 - 0.9 acres
a. Municipal wastewater................................			
b. Municipal sewage sludge............................			
c. Municipal run-off..................................			
d. Industrial waste...................................			
e. Agricultural waste.................................			
f. Mining waste.......................................			
g. Oil or gas waste...................................			
h. Other (e.g., drinking water treatment sludges) [SPECIFY]: ________________ ________________			
i. TOTAL NUMBER OF SURFACE IMPOUNDMENTS BY ACREAGE CATEGORY................................			

surface impoundments with:

D. 1 - 5 acres	E. 6 - 10 acres	F. 11 - 100 acres	G. More than 100 acres	H. Total number of surface impoundments by type	
					a. Municipal wastewater
					b. Municipal sewage sludge
					c. Municipal run-off
					d. Industrial waste
					e. Agricultural waste
					f. Mining waste
					g. Oil or gas waste
					h. Other

Q2. In the table below, please enter the number of active individual Subtitle D surface impoundments (by surface impoundment type) according to the amount of waste received in 1984. Column G totals should equal the number of surface impoundments in Question P2.

	Number of active individual Subtitle D surface			
Surface impoundment type	A. Received less than 50,000 gallons per day	B. Received 50,000 - 99,999 gallons per day	C. Received 100,000 - 499,999 gallons per day	D. Received 500,000 - 999,999 gallons per day
a. Municipal wastewater........				
b. Municipal sewage sludge.....				
c. Municipal run-off...........				
d. Industrial waste............				
e. Agricultural waste..........				
f. Mining waste................				
g. Oil or gas waste............				
h. Other (e.g., drinking water treatment sludges) [SPECIFY]: ______ ______				
i. TOTAL NUMBER OF SURFACE IMPOUNDMENTS BY CATEGORY				

impoundments by amount of waste received in 1984:

E. Received 1,000,000 - 9,999,999 gallons per day	F. Received 10,000,000 or more gallons per day	G. Total number of surface impoundments by type [THIS SHOULD EQUAL THE NUMBER IN P2]	
			a. Municipal wastewater
			b. Municipal sewage sludge
			c. Municipal run-off
			d. Industrial waste
			e. Agricultural waste
			f. Mining waste
			g. Oil or gas waste
			h. Other

Q3. In the table below, please enter the number of active individual Subtitle D surface impoundments (by surface impoundment type) that had groundwater, surface water, and air emissions monitoring in 1984.

Surface impoundment type	Number of active individual Subtitle D surface impoundments that had:		
	A. Groundwater Monitoring	B. Surface Water Monitoring	C. Air Emissions Monitoring
a. Municipal wastewater...............................			
b. Municipal sewage sludge...........................			
c. Municipal run-off.................................			
d. Industrial waste..................................			
e. Agricultural waste................................			
f. Mining waste......................................			
g. Oil and gas waste.................................			
h. Other (e.g., drinking water treatment sludges) [SPECIFY]: ______ ______			
e. TOTAL NUMBER OF SURFACE IMPOUNDMENTS WITH EACH TYPE OF MONITORING:			

280<

Q4. In the table below, please estimate the number of active individual Subtitle D surface impoundments (by surface impoundment type) that had or used the following release prevention/management methods in 1984:

Management method	Number of active individual Subtitle D			
	A. Municipal wastewater	B. Municipal sewage sludge	C. Municipal run-off	D. Industrial waste
a. Synthetic liners				
b. Natural liners (e.g., clay).				
c. Leak detection systems				
d. Overtopping controls				
e. Waste restrictions (ban on certain Subtitle D waste types). . .				
f. Discharge permit				

surface impoundments				
E. Agricultural waste	F. Mining waste	G. Oil or gas waste	H. Other (e.g., drinking water treatment sludges) [SPECIFY]: ____________ ____________	
				a. Synthetic liners
				b. Natural liners
				c. Leak detection systems
				d. Overtopping controls
				e. Waste restrictions
				f. Discharge permit

Q5. Certain non-household hazardous wastes are exempted from Federal and some State hazardous waste regulations if generated in small quantities. Please indicate the percentage of Subtitle D surface impoundments of each type that receive such wastes?

Surface impoundment type	Percent that receive exempted non-household hazardous wastes.
a. Municipal wastewater	______%
b. Municipal sewage sludge.	______%
c. Municipal run-off.	______%
d. Industrial waste	______%
e. Agricultural waste	______%
f. Mining waste	______%
g. Oil or gas waste	______%
h. Other (e.g., drinking water treatment sludges) [SPECIFY]: ______________________	______%

R. AVAILABILITY OF SURFACE IMPOUNDMENT DATA

R1. In the table below, please estimate the proportion of individual Subtitle D surface impoundments (by surface impoundment type) for which your State has each type of monitoring data available:

Surface impoundment type	A. Groundwater monitoring data available for: [CIRCLE ONE CODE FOR EACH SURFACE IMPOUNDMENT TYPE]			B. Surface water monitoring data available for: [CIRCLE ONE CODE FOR EACH SURFACE IMPOUNDMENT TYPE]			C. Air emission monitoring data available for: [CIRCLE ONE CODE FOR EACH SURFACE IMPOUNDMENT TYPE]		
	None (0%)	Some (1-50%)	Most (>50%)	None (0%)	Some (1-50%)	Most (>50%)	None (0%)	Some (1-50%)	Most (>50%)
a. Municipal wastewater	1	2	3	1	2	3	1	2	3
b. Municipal sewage sludge	1	2	3	1	2	3	1	2	3
c. Municipal run-off	1	2	3	1	2	3	1	2	3
d. Industrial waste	1	2	3	1	2	3	1	2	3
e. Agricultural waste	1	2	3	1	2	3	1	2	3
f. Mining waste	1	2	3	1	2	3	1	2	3
g. Oil and gas waste	1	2	3	1	2	3	1	2	3
h. Other (e.g., drinking water treatment sludges) [SPECIFY]: ______ ______ ______	1	2	3	1	2	3	1	2	3

R2. Please estimate the number of individual Subtitle D surface impoundments (by surface impoundment type) for which your State has case studies. (Case studies include monitoring data, but in addition include a sufficient level of detail on site design and operating practices to provide some indication of the causes for success or failure of the surface impoundment to protect human health and the environment. Some case studies may also include information on design and operating costs of the surface impoundment.)

[IF YOU ARE NOT AWARE OF ANY CASE STUDIES OF SUBTITLE D SURFACE IMPOUNDMENTS IN YOUR STATE, PLEASE PLACE A CHECK (✓) IN THE BOX: ☐, AND SKIP TO QUESTION R4.]

Surface impoundment type	Number of individual Subtitle D surface impoundments	
	A. With case studies	B. With case studies that include design and operating costs
a. Municipal wastewater......................		
b. Municipal sewage sludge..................		
c. Municipal run-off..........................		
d. Industrial waste...........................		
e. Agricultural waste........................		
f. Mining waste..............................		
g. Oil or gas waste..........................		
h. Other (e.g., drinking water treatment sludges) [SPECIFY]:		

R3. List any alternate sources of case study information that you know of in your State (e.g., local governments that have surface impoundment case study data).

SOURCE:	CONTACT PERSON	(AREA CODE) TELEPHONE
		( )
		( )
		( )

R4. Does your State already have a list (or file) of establishments with Subtitle D surface impoundments?

Yes [GO ON TO QUESTION R5]. 1
No [SKIP TO QUESTION S1]. 2

R5. In what format is(are) the list(s)? [EXAMPLES: ON A COMPUTER FILE, IN A CARD FILE, ON A WORD PROCESSING DISK, ETC.]

R6. What does(do) the list(s) cover? [EXAMPLES: PERMITTED SURFACE IMPOUNDMENTS ONLY, INDUSTRIAL SURFACE IMPOUNDMENTS ONLY, ALL TYPES OF SURFACE IMPOUNDMENTS THAT ARE LARGER THAN ONE ACRE, ETC.]

R7. If possible, please attach copies of any list(s) to this completed questionnaire. If this is not possible, please indicate below how EPA could obtain a list of surface impoundments in your State.

S. CONTACT INFORMATION AND COMMENTS AND ATTACHMENTS: SURFACE IMPOUNDMENTS

S1. Please identify a contact person for this suface impoundments section of the survey, should it be necessary to clarify responses:

Contact Name: ______________________________

Title: ______________________________

Agency/Program: ______________________________

Telephone: (______) ______________________ Ext.: __________

S2. COMMENTS - Please include any comments or further amplification of responses to Sections N through R below or on attached sheets.

____

____

____

____

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____

S3. CHECKLIST OF ATTACHMENTS TO PART IV - SURFACE IMPOUNDMENTS:
[Please check ( ) the appropriate box if you have attached the following]:

- a. Schedule of State permit fees (Question N5) . . . . ☐
- b. State Subtitle D surface impoundment regulations (Question N6). . . . . ☐
- c. Checklist of State critieria for inspections (Question O3). . . . . . . ☐
- d. List of establishments with Subtitle D surface impoundment (Question R7) . . . . ☐
- e. Attached comment sheets (Question S2) . . . . ☐

U.S. ENVIRONMENTAL PROTECTION AGENCY
STATE SUBTITLE D PROGRAM QUESTIONNAIRE

CERTIFICATION STATEMENT

THE DIRECTOR OF STATE SOLID WASTE PROGRAMS, OR HIS AUTHORIZED REPRESENTATIVE, MUST SIGN AND DATE THE CERTIFICATION WHERE INDICATED. THE PRINTED OR TYPED NAME OF THE PERSON SIGNING THE CERTIFICATION MUST ALSO BE INCLUDED WHERE INDICATED.

CERTIFICATION

I certify that I have examined the information submitted in this and all attached documents, and that the submitted information is accurate, and as complete as possible.

PRINT OR TYPE NAME	SIGNATURE	DATE SIGNED

AFTER COMPLETING THIS QUESTIONNAIRE, RETURN IT TO EPA IN THE ENVELOPE ENCLOSED IN THE QUESTIONNAIRE PACKAGE.

PLEASE RETURN ALL COMPLETED SECTIONS OF THE MASTER QUESTIONNAIRE IN THE SAME ENVELOPE.